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History of Botanical Exploration in Territorio Federal Amazonas, Venezuela

OTTO HUBER
and
JOHN J. WURDACK



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ABSTRACT

Huber, Otto, and John J. Wurdack. History of Botanical Exploration in Territorio Federal Amazonas, Venezuela. *Smithsonian Contributions to Botany*, number 56, 83 pages, 2 tables, 10 maps, 1984.—Detailed information is provided on botanical activities in the Territorio Federal Amazonas, southern Venezuela, during the period 1800 to 31 December 1982. Emphasis is on botanical collections, their collectors, localities, itineraries, time period, number, and final deposit in the world's herbaria. The data are arranged both chronologically and alphabetically by collectors, including cross references between main and secondary collectors. Altogether 188 collectors are listed, 124 of them being main collectors. The total collected plant numbers in T. F. Amazonas is now about 50,000 (not including duplicates), representing an estimated 3000 to 5000 species. A short geographical outline at the beginning of the paper, accompanied by a map, provides general information on main localities, rivers, mountains, and other features often mentioned in the text and on the labels of herbarium specimens.

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History of Botanical Exploration in Territorio Federal Amazonas, Venezuela

*Otto Huber
and John J. Wurdack*

Introduction

Among the many natural regions of South America, the southernmost portion of Venezuela, including the headwaters of the Orinoco River and part of the Amazon Basin, has long attracted the interest of botanists and naturalists in general. Such historic expeditions as those undertaken to these regions by Humboldt and Bonpland in 1800 and by Schomburgk in 1839 may well be considered as among the first highlights in tropical American botany. These trips were forerunners of an increasing number of explorations in the astonishing vegetation types covering Territorio Federal Amazonas. Because of the increasing attention given in the past two decades to the Amazon region in general, mainly by governmental developmental agencies in Brazil, Venezuela, Colombia, Ecuador, and Perú, it also has become evident that the basic ecologic information on the plant life and plant geography of this extremely rich portion of the American tropics is still poorly known and still more poorly understood (Goodland and Irwin, 1975).

This paper offers a synopsis of botanical exploration carried out from 1800 to the present (1982) in the Venezuelan Territorio Federal Amazonas, with general information on the collectors, collecting expeditions, and collecting stations, as well as on the number and final disposition of the specimens collected and related publications. We are well aware that this paper is incomplete, because this type of research is often accompanied by insufficient data. Nevertheless, we believe that the data submitted are sufficiently accurate to serve as a basis to stimulate future investigation in this direction, not only in the field but also in herbaria and libraries.

The acronyms for Venezuelan government agencies used in the text and lists are explained in the "Annotated List of Collectors." These acronyms (those asterisked are directly involved in a collection program) include *AsoVAC (Asociación Venezolana para el Avance de la Ciencia), *CASUB (Centro de Actividades Subacuáticas de la Universidad de Oriente, Cumaná), *CODESUR (Comisión para el Desarrollo del Sur de Venezuela), CONICIT (Consejo Nacional de Investigaciones Científicas y Tecnológicas), *INPARQUES (Instituto Nacional de Parques), *IVIC (Instituto Venezolano de Investigaciones Científicas), MAB (Man and Biosphere

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Program, UNESCO), * MARNR (Ministerio del Ambiente y de los Recursos Naturales Renovables), *MOP (Ministerio de Obras Públicas), *UCV (Universidad Central de Venezuela), *ULA (Universidad de Los Andes), and UNELLEZ (Universidad Experimental de los Llanos "Ezequiel Zamora"). For herbaria, the abbreviations are from *Index Herbariorum*, seventh edition (Holmgren et al., 1981).

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The authors wish to express their gratitude to the curators of the following herbaria for permission to consult specimens and archives: MER, MERF, MY, MYF, NY, US, VEN. Also, we are grateful to colleagues and friends all over the world who have provided us with the necessary information about their collecting activities in Territorio Federal Amazonas. We wish to thank especially María Huber, Julian A. Steyermark, Stephen Tillett, Markus Colchester, and Sarah K. Eichhorn for their great help during the preparation of the manuscript. J.L. Zarucchi contributed, from a paper in preparation, information on Spruce's collections.

The maps were drawn by Tomás Rodríguez, Caracas, Venezuela, and their inclusion in this study is made possible by the gracious permission of the Dirección General de Información e Investigación del Ambiente, Ministerio del Ambiente y de los Recursos Naturales Renovables, República de Venezuela.

GEOGRAPHY

The Territorio Federal Amazonas occupies the southernmost portion of the Republic of Venezuela. It is located between 0°40'N–6°15'N and 63°20'W–67°50'W; the area is 178,095 km² (CODESUR, 1979). It is subdivided into four administrative departments: Departamento Atures (capital, Puerto Ayacucho); Departamento Atabapo (capital, San Fernando de Atabapo); Departamento Casiquiare (capital,

Maroa), and Departamento Río Negro (capital, San Carlos de Río Negro). Since 1924 Puerto Ayacucho has been the capital of the Territorio. It currently has approximately 20,000 inhabitants and is the seat of the Governor and other public regional institutions. Other major towns and settlements are San Fernando de Atabapo, San Carlos de Río Negro, Maroa, San Juan de Manapiare, Yavita, Santa Bárbara, San Antonio, Esmeralda, Victorino, Santa Rosa de Amanadóna, Guarinuma, Macurucu, and Cacurí (see Map 1, at back of book).

The Territorio Federal Amazonas is limited on the north by the Distrito Cedeño of the adjoining Venezuelan Estado Bolívar; on the east by the Territorio Federal Roraima of Brazil; on the south by the Estado do Amazonas, Brazil; and on the west by the Comisaría Vichada and Vaupés of Colombia. These boundaries are formed in most cases by natural watersheds at the tops of mountains and mountain ranges (in the northern, eastern, and southern frontiers); the western boundaries are formed by the courses of the Ríos Orinoco, Atabapo, Guainía, and Negro. In only two cases has the frontier been delimited artificially: in the southwestern portion (Venezuelan-Brazilian frontier) by a line drawn between Piedra de Cocuy on the Río Negro and the Salto Huá on Caño Maturacá at the western base of Sierra Neblina, and in the Guainía-Atabapo region (Venezuelan-Colombian frontier), where an artificial boundary line is drawn approximately from the confluence of the three rivers Atacavi, Temi, and Guasacavi to the west of the village of Victorino on the Río Guainía.

Physiography

The Territorio Federal Amazonas has two main physiographical regions, the vast peneplain of the Casiquiare in the central and southwestern section and the huge mountain systems embracing the Territorio to the north, east, and south. Between these generally level lowlands and the different mountain systems, several piedmont

landscapes of variable width and altitude are developed; in these, the frequent, isolated granite hills ("inselbergs," "lajas") form the most outstanding features. Because of the complicated geological and geomorphological history of the Territorio, which is not yet clearly understood, this region at the southwestern border of the Guayana Shield offers an overwhelming variety of different landscapes and other topographic features within a relatively small area.

MOUNTAIN SYSTEMS.—From north to south and from west to east the following main mountain systems can be distinguished (see Map 1).

Cerros Guanay, Santo, Camani, Morrocoy, Coro-coro, Yutajé, Yaví, and Ualipano.

This mountain chain extends along the northern-central boundary between T. F. Amazonas and Estado Bolívar. The general height of these mountains ranges between 840 m (Cerro Morrocoy west of San Juan de Manapiare) and nearly 2300 m (Cerro Yaví in the upper Parucito Valley), whereas the remaining mountains have altitudes of 1500–1800 m. All of them except Cerro Ualipano (which is also called Cerro Calentura and is of granitic origin) are typical table mountains ("tepui") with more or less flat surfaces formed by sandstone belonging to the Roraima Formation; they arise abruptly from the surrounding piedmont and lowland region with vertical cliffs up to 400 m high. (Further literature in Hitchcock, 1947, 1948; Lasser and Maguire, 1950; Maguire and Phelps, 1951; Mayr and Phelps, 1967).

Cerros Autana, Cuao, Sipapo (Paraque).

Located to the southeast of Puerto Ayacucho, this mountain system is one of the largest in T. F. Amazonas. Its highest elevations reach approximately 2000 m (no definite altitude measurements available) and most of the surface is flat to slightly inclined towards the east, showing typical tepui landscape with a dissected plateau. The upper rock strata consist of Roraima Formation. The spectacular Cerro Autana, at the western end of the range, is an isolated tower with an altitude of approximately 1300 m and a surface of about 0.3 km²; it is, therefore, the westernmost Venezuelan tepui and at the same time the smallest in area. Cerro Autana was declared a natural monument in 1978. (Additional literature: Mayr and Phelps, 1967; Colvée, 1973; Steyermark, 1974, 1975; Brewer-Carías, 1976).

Cerros Parú (A'roko) and Asisa.

This range is located in the headwaters of the Río Ventuari to the southwest of Cacuri (a recent Ye'kuana (Makiritare) settlement on the upper Ventuari). It reaches approximately 2000 m at its highest southwestern point, but the

main level is between 1100 and 1600 m. The strongly dissected internal plateaus are more or less flat and formed by sandstone of the Roraima Formation, as are the outer cliffs. The southwestern portion is called Cerro Asisa, but it forms part of the entire massif of Parú. (Additional information: Mayr and Phelps, 1967; Hoyos, 1973).

Cerro Yapacana.

This elongated sandstone table mountain of approximately 1250 m elevation is located about 40 km southeast of the Orinoco-Ventuari confluence. It is entirely covered by forest, except on some cliffs at the northern and the southern faces. It is the only isolated mountain arising from the Casiquiare peneplain. Due to the extraordinary biological value of the flora and fauna found on this mountain and in the surrounding lowlands, the Venezuelan government in 1978 decreed this area as the "Parque Nacional Yapacana." (Further information: Mayr and Phelps, 1967).

Cerros Duida, Marahuaca and Huachamacari.

This famous and spectacular mountain system is one of the largest in T. F. Amazonas and reaches its highest elevation of approximately 2850 m in Cerro Marahuaca. Cerro Huachamacari reaches about 1700 m, and Cerro Duida 2400 m on its southern ridge. These mountains are located in the central part of the Territorio, just to the northwest of Esmeralda on the upper Orinoco, and to the east and north of the Río Cunucunuma. All three mountains, isolated from one another by steep valleys, are typical tepuis of the Roraima Sandstone Formation. Duida is by far the largest one, covering approximately 400 km²; the other two mountain systems are much smaller in extent. Cerros Duida and Marahuaca together form the "Parque Nacional Duida-Marahuaca," established in December 1978. (Further literature: Humboldt, 1818–1829; Schomburgk, 1840a,b; Tate and Hitchcock, 1930; Schomburgk, 1931; Mayr and Phelps, 1967; Medina, 1969).

Sierra Parima.

The Parima range extending from north to south forms the eastern boundary of T. F. Amazonas with Brazil. It shows the geomorphological features of an "altiplano" ranging generally between 900 and 1200 m in altitude, and has a slightly dissected, rather undulating relief with smooth to conical peaks up to 1500 m. Apparently, only a few isolated remnants of the Roraima Formation are found within the Parima range, which consists mainly of granitic rock formations of the igneous basement of the Guayana Shield (RADAMBRASIL, 1975). (Additional information: Schomburgk, 1840a,b; Koch-Grünberg, 1917; Rice, 1928, 1937; Holdridge, 1933; Smole, 1976).

Sierras Unturán and Tapirapeco.

No data are available on this large mountainous area south of the uppermost headwaters of the Río Orinoco and bordering the Río Matapire to the north (Sierra Unturán) and to the south (Sierra Tapirapeco). The average height

of these mountains may well reach or exceed 1000 m. So far, no sandstone formations have been recorded for this region.

Sierra de la Neblina, Cerro Avispa, Cerro Aracamuni, Sierra Imeri.

These are the southernmost mountains of Venezuela, forming an enormous complex of plateaus, valleys, slopes and cliffs, all now in the recently declared "Parque Nacional Neblina" (December 1978). Pico Phelps, just 600 m south of the Venezuelan border on Sierra Neblina, is the highest elevation of Brazil, 3045 m. Most of the massif ranges between 1200 m (Cerro Aracamuni to the north) and 2100–2500 m (Cerro de la Neblina to the south). Cerros Aracamuni and Avispa unmistakably bear the character of flat-topped tepuis. Cerro de la Neblina shows a much more irregular topography on its summit, which consists mainly of quartzitic sediments. (Further literature: Maguire, 1955; Maguire and Wurdack, 1959, 1960; Ort, 1965; Mayr and Phelps, 1967).

LOWLANDS.—The lowland region of T. F. Amazonas has elevations ranging from 60 m near the confluence of the Ríos Orinoco and Meta at the northwestern edge to approximately 500 m in the uppermost headwater region of the Ríos Orinoco and Ventuari. Most of the extensive Casiquiare peneplain lies at an altitude ranging between 100 and 200 m. At least five distinct physiographic lowland plains can be identified within the Territorio, proceeding from north to south and from west to east as listed.

Piedmont region.

This region includes the Orinoco to the east between San Fernando de Atabapo and its confluence with the Río Meta; it extends eastward from the right-hand side of the river to the base of the Serranías Cuao and Sipapo. The northern section of this area consists of gently rolling landscape with many isolated granitic outcrops up to 400 m high. The vegetation is predominantly forest, interrupted by more or less extensive savannas. The southern section is nearly flat and densely covered by tall forests, except the southernmost portion, where wide open savannas begin to predominate.

Manapiare basin plains.

These extensive alluvial plains cover most of the basin drained by the Ríos Manapiare and Parucito and are completely flat. The northern part is covered by inundated savannas and forests, whereas the southern half is covered densely by tall forests.

Ventuari plains.

This region extends from the confluence of the Río Ventuari with the Orinoco on the west to the headwaters

region of the Río Ventuari on the east. The area is drained by the Ventuari and its left-hand tributaries Yureba, Muqueta, Parú and Asisa and by the right-hand tributaries Caños Corocoro and Picure (or Guapuchi) in its lower section. These plains are covered by a mosaic of partly inundated savannas and forests.

Casiquiare Peneplain.

This is the largest lowland area of T. F. Amazonas, covering more than a third of its entire surface (approximately 60,000 km²). It is delimited as follows: to the north by the Río Orinoco from San Fernando de Atabapo to its junction with the Río Ventuari and by the lower section of the Ventuari itself; to the east by the mountain systems of Serranía del Tigre (south of Carmelitas or Yacurai on the lower Ventuari) and of Huachamacari-Duida up to Esmeralda, then by the Ríos Orinoco and Mavaca; to the south by the Serranía del Unturán and Cerro Aracamuni; and to the west, by the Ríos Atabapo, Guainía and Negro (in Venezuela; but the Casiquiare peneplain extends further westward into Colombia). This extensive area is drained by four river systems: the Río Orinoco and all its eastern tributaries between Esmeralda and Santa Bárbara (Ríos Cunucunuma, Guanami, Puruname, and Yagua); the Río Atabapo and its eastern tributaries (Caño Caname, Río Atacavi, Río Temi); the Río Guainía between Victorino and its confluence with the Río Casiquiare and its left-hand tributaries (Caño Pimichin, Caño San Miguel or Conorochoite, and Caño Tiringuín); and, finally, the Caño or Brazo or Canal Casiquiare itself together with its southern tributaries (Río Pamoní, Río Pasiba, Ríos Manipare and Siapa, and Río Pacimoni). The Casiquiare peneplain has only a few emergent hills, such as the Serranía Cariche west of the bifurcation on the left bank of the Río Orinoco, less than 300 m high. In the region south of the Casiquiare, isolated granitic outcrops are common. The best known are Piedras Culimacare and Guanari, on the left bank of the lower Casiquiare, and Laja Catipán on the lower Yatúa, a tributary of the Río Pacimoni. The vegetative cover of the Casiquiare peneplain is formed predominantly by lowland rain forests in the central and eastern sections, by a mosaic of savannas, scrub, and low to medium forests in the northern section, and by "caatinga" forests in the southwestern section.

Upper Orinoco piedmont plains.

This heavily forested lowland, between 200 and 500 m above sea level, extends between the eastern bank of the upper Orinoco from Esmeralda to its confluence with the Río Manaviche, and the western base of the Sierra Parima, continuing southward east of the Río Mavaca until it reaches the northern base of Sierra de Unturán. The main rivers draining the area are the Orinoco and its right-hand tributaries Río Ocamo, Río Padamo (formed by the Ríos Cuntinamo, Botamo or Uotamo, and Matacuni) and Caño Iguapó (Humboldt's "Guapo"); from the south the only important tributary is the Río Mavaca.

Additional information on the geographical features of the lowland regions of T. F. Amazonas are given in the classical accounts of Humboldt (1818–1829), Schomburgk (1840a,b), Wallace (1853), Michelena y Rojas (1867), Chaffanjon (1889), Spruce (1908), Rice (1921), Tate and Hitchcock (1930), Schomburgk (1931), Hitchcock (1947, 1948).

This brief geographical outline of the Territorio Federal Amazonas provides a general account of the names of the main rivers, mountains, towns and villages referred to widely by the collectors cited in the next sections. For additional detailed information the following may also be consulted: Tavera-Acosta (1906, 1913–1914), Jahn (1909a,b), Friel (1924), Roncayolo (1934), Ramos Pérez (1946), Gomez Picón (1953), Maguire (1979), and the (partly unpublished) reports of CODESUR produced between 1970–1979. Of these the most significant is the one that resulted from the radar inventory of Territorio Federal Amazonas and the accompanying set of maps (Aeroservice, 1972).

Until 15 to 20 years ago, the most important maps of the region were the sheets NA-19, NA-20, NB-19, and NB-20 of the American Geographical Society's map of Hispanic America, scale 1:1,000,000. During the years 1971–1972, the already mentioned radar inventory, carried out by Aeroservice on behalf of CODESUR, covered cartographically the entire Territorio Federal Amazonas and adjacent Distrito Cedeño of Estado Bolívar. As a result, a base map, scale 1:1,000,000, was produced by the Cartografía Nacional of Venezuela in 1975. Today this is considered the official map of that region. It should be emphasized here that, since 1975, all modern expeditions to Territorio Federal Amazonas, especially those trips made by helicopter, have used this base map and its toponymy for the identification of their collecting sites and areas visited.

This same radar inventory also has provided a set of 19 maps on the scale of 1:250,000 for each of the following themes: "Geology and Geomorphology," "Soils," "Hydrography," and "Vegeta-

tion." These maps have not been published but may be consulted at the offices of Cartografía Nacional of the Ministerio del Ambiente y de los Recursos Naturales Renovables (MARNR) in Caracas. Another recent cartographic publication on T. F. Amazonas is the *Atlas de la Región Sur* by CODESUR (1973; 1979, second edition). Finally, many kinds of expeditions to regions south of the Orinoco are widely employing LANDSAT- and ERTS-satellite imagery.

TRANSPORTATION

By far the most important means of transportation is still fluvial navigation by small- to medium-sized boats. "Curiara" and "bongo" are small boats (dugouts) made from a single tree trunk by hollowing out and opening the trunk with fire. This is a technique of long tradition in T. F. Amazonas among the Makiritare Indians (which are by far the most river-bound tribe). A large-sized curiara or bongo can be up to 12–15 m long, carry one to two tons of cargo and is often provided with a palm roof or, more recently, a tin roof. "Falcas" and "piraguas" (the latter term is no longer used) are boats of larger size made of wooden planks and provided generally with a small room at the rear of the boat. These are the largest boats, irregularly navigating for commercial and trading purposes the upper Orinoco above the rapids of Maypures at Samariapo and the Río Negro. Navigation on the Ríos Casiquiare, Atabapo, Guainía and Manapiare, as well as on the upper part of the Río Ventuari is determined by the strong fluctuations of the river levels between the rainy seasons (March to December) and the relatively dry season (during the rest of the year).

Next of importance today is the airplane. The capital of Puerto Ayacucho can be reached daily in 50 minutes by jet from Caracas. Most major settlements within the Territorio are served by a regular monomotor airline network. During the first period of activity of CODESUR (1970–1973), many small landing strips were con-

structed in regions hitherto inaccessible other than by river.

Three roads outside of towns now exist in the Territorio. One, recently paved and about 160 km, runs from Puerto Nuevo (El Burro in front of the confluence of the Orinoco and Meta) to Puerto Ayacucho and to Sanariapo (or Samariapo). In the near future, this road will connect the Territorio with the adjoining Distrito Cedeño of Estado Bolívar and with Caicara on the Orinoco. Another road, unpaved, goes from Yavita to Pimichin to Maroa, approximately 38 km. The first part (Yavita to Pimichin) was used by Humboldt in 1800; the second part (Pimichin to Maroa), as well as the airfield of Maroa, was constructed by CODESUR in 1972–1973. The third road extends from San Carlos de Río Negro to Solano, connecting the Río Negro with the Casiquiare. It has a length of approximately 20 km and was built by CODESUR in 1973.

Chronology of Botanical Exploration

GENERAL

In this section, a chronological resumé of the main phases of botanical exploration in Territorio Federal Amazonas is given. In Table 1, however, a complete chronological record of all botanical collectors, together with the areas visited by them in T. F. Amazonas between 1800 and 1982 (inclusive), also may be consulted for major details.

Although there is no doubt that the first actual herbarium specimens from T. F. Amazonas were gathered by Humboldt and Bonpland in 1800, there must have been some earlier specimens of wild cocoa collected by missionaries or other travelers around 1730–1740 in the upper Orinoco region (Ríos Padamo and Ocamo). As a matter of fact, in 1754 an official botanist, Pehr Loeffling, a student of Linnaeus, was sent on the Solano expedition specifically to gather authentic specimens of cocoa and other useful plants, such as the Pará- or Brazil-nut, in the upper Orinoco region. Previous samples of cocoa that were

brought to the attention of Linnaeus had been identified as *Theobroma cacao* L. and were reputed to be of better quality than the races from the Brazilian Amazon (Ramos Pérez, 1946). The premature death of Loeffling on the lower Orinoco delayed botanical exploration of the Territorio Federal Amazonas by some 40 years. Although Solano's expedition hired several persons as substitutes for Loeffling, they do not seem to have collected botanical specimens, for no herbarium material resulting from their activities is known to have reached Europe.

As has already been mentioned above, the expedition of Alexander von Humboldt and Aimé Bonpland to the upper Orinoco region in April to June 1800 must be considered the first real botanical exploration in this area. Despite the extremely difficult conditions so vividly described by Humboldt, 500 to 1000 collections were made, mainly by Bonpland, and an impressive number of them were new to science. The route followed by Humboldt and Bonpland took them only through the lowlands of the Territorio. Most of their collections were made in riverine forests or in forests and open places around the main settlements of Atures, Maypures, San Fernando de Atabapo, Yavita, San Carlos de Río Negro, and Esmeralda.

Thirty-nine years later, between January and March 1839, the next botanical exploration was carried out, this time by a geographer entering the Territorio from the opposite side of that of Humboldt and Bonpland. Robert Hermann Schomburgk traveled from the northern Parima mountains to Esmeralda, partly by walking and partly by navigating the Ríos Cuntinamo and Padamo. From Esmeralda he continued his exploration down the Ríos Orinoco, Casiquiare and Negro into Brazil, thence back to Guyana via the Río Branco.

Next, from April 1853 to November 1854, Richard Spruce made his historical plant-collecting expeditions over wide areas of the Territorio, becoming also the first botanist to visit the Río Cunucunuma and the Ríos Pacimoni and Yatúa. His extensive collections, together with those of

Humboldt and Bonpland, provided the basic flora of the region for more than 80 years. Somewhat earlier, from February to March 1852, his colleague, the famous naturalist Alfred Russel Wallace, spent two months in intensive observations (collecting plants and insects) at Yavita; unfortunately almost all his collections were lost during the return to Europe.

During the 19th Century a number of explorers tried to reach the sources of the Río Orinoco, the most important being Arnaud (1835–1837), Codazzi (1838), and Michelena y Rojas (1855–1876), but only the expedition of Chaffanjon in 1886 obtained plant collections. Chaffanjon was followed, a year later, by another French botanist, Gaillard, who made extensive cryptogamic (and some phanerogamic) collections from the regions around Atures (Puerto Ayacucho) and San Fernando de Atabapo. In the same year, the first Venezuelan naturalist and botanist, Alfredo Jahn, together with Vincent Marcano, visited the Territorio Federal Amazonas and made a small collection of plants later described by Ernst (1888).

After more than 30 years of botanical inactivity in T. F. Amazonas, Hamilton Rice made an expedition in 1920 to the Ríos Negro, Casiquiare, and upper Orinoco. This was the first time a motor-powered launch was used in this region. Although no collections were made during Rice's expedition, interest in the region was again stimulated. A few years later, in 1928, G.H.H. Tate, leading an American Museum of Natural History expedition to Cerro Duida ("Tyler-Duida Expedition"), was the first to explore the fauna and flora of a tepui in T. F. Amazonas, obtaining many species and genera new to science. During 1929 to 1931 the ornithologist Ernest Holt collected plants twice along the Ríos Orinoco, Casiquiare, and Negro. In 1931, he made the first ascent to the summit of Cerro Yapacana, collecting only birds there.

In the late thirties another legendary explorer, Capitán Félix Cardona, made his first expedition in Amazonas. He was a member of the Venezuelan-Brazilian Frontier Commission, which was

the first to visit (1945–1946) the southernmost mountains in the headwaters of the Río Siapa or Matapire, as the upper course of this river is now called.

During August to September 1944, Julian Steyermark made his first trip to T. F. Amazonas, making the second ascent to the summit of Cerro Duida. This outstanding botanist collected a large number of previously unknown plant taxa.

An extensive ornithological exploring program to most of the principal tepuis of Estado Bolívar and T. F. Amazonas was undertaken by W.H. Phelps, Jr., and his colleagues between 1938 and 1955. This was followed starting in 1948 in T. F. Amazonas by an equally intensive program of expeditions led by Bassett Maguire of The New York Botanical Garden. Maguire and his colleagues, Cowan and Wurdack, carried out the most complete plant collecting survey ever made in Amazonas. Their collection total in Amazonas exceeded 10,000 numbers, with many new species, genera and even families represented.

Another famous exploration was the "Expedición Franco-Venezolana a las Fuentes del Orinoco" (French-Venezuelan expedition to the sources of the Orinoco), which started in July 1951 from Esmeralda and in November reached for the first time the sources of that magnificent river. From this expedition the well-known botanist and biogeographer, León Croizat, brought back more than 1000 numbers of plants from a region hitherto unvisited by any botanist.

Other botanical expeditions in the fifties and early sixties were made by Vareschi and the bryologist K. Mägdefrau (1958) in commemoration of the centennial of Humboldt's death ("Humboldt-Gedächtnis-Expedition 1958"); by Foldats to the Río Atacavi, a tributary of the Río Atabapo (1960); and by Breteler to the region of Isla Ratón and the lower Río Sipapo (1965).

The epoch of modern expeditions by means of airplane and helicopter support was preceded, in the early sixties, by a number of aerial reconnaissance flights made by such famous jungle pilots as Harry Gibson. Among other important

observations, Gibson discovered the caves of Cerro Autana on 8 March 1950 and the spectacular sinkholes on top of Cerro Sarisariñama in Estado Bolívar on 25 November 1961. The first truly botanical expedition by airplane to T. F. Amazonas was made in July 1967 by Vareschi and his friend and expert pilot, Dr. E. Herbig. They landed a small airplane in a natural savanna of the remote Parima region at Simarawochi (headwaters of Río Maturín). During their visit, they carried out botanical and ecological studies of the surrounding area.

In March of the same year, Phelps and collaborators completed the first expedition by helicopter to a tepui in the Guayana Highlands, to the Jaúa-Sarisariñama massif in Estado Bolívar. Thus was inaugurated an entirely new style of exploration, which soon was to become adopted in most later Venezuelan expeditions. The first helicopter expedition in T. F. Amazonas took place in January 1969 during the AsoVAC-Expedition to Cerro Duida and the upper Orinoco region; it was based at Esmeralda and was conducted by E. Medina and his botanical colleagues M. Fariñas and J. Velásquez.

The "Geographical Magazine Amazonas Expedition by Hovercraft" during April and May 1968 was another memorable expedition: T. F. Amazonas was crossed from south to north, coming from Manaus enroute to the island of Trinidad. Among the scientific personnel were the British geographers, M. Eden, D.R. Harris, and J.B. Thornes, and the Venezuelan ecologist E. Medina.

The decade beginning in 1970 has been characterized by an impressive increase of botanical research in Venezuelan Amazonas. The recent creation of a governmental development agency for the Territorio Federal Amazonas (CODESUR) focused much attention between 1970 and 1974 on the natural resources of this region and the possibilities of their exploitation. CODESUR was the Venezuelan counterpart to the Brazilian program, which in the late sixties implemented a development plan for its Amazonian highway system. During 1971 and 1972, an extensive radar inventory of the natural resources of the

Territorio gave, for the first time, precise basic information on the river systems, physiography, geology, geomorphology, soils, vegetation, and landscapes of the upper Orinoco basin. Also in the course of the CODESUR program, spectacular expeditions were carried out. These include the trip to Cerro Autana in September 1971 by Brewer-Carías and Steyermark and the first exploration of the summit of Cerro Marahuaca during January and February 1975 by Tillett and his companions. As a result of these expeditions, a wealth of new information was gathered on the botany of this western section of the Guayana Highlands.

During 1974, one of the most important research projects on tropical forests was started at San Carlos de Río Negro. It was organized by an international and multidisciplinary team of scientists (mainly ecologists) under the direction of E. Medina and R. Herrera (both from IVIC, Venezuela), H. Klinge (Max-Planck-Institut, Federal Republic of Germany), and C. Jordan (University of Georgia, U.S.A.), under the auspices of UNESCO'S "Man and Biosphere" research program. The presence of a resident botanist, H. Clark, at San Carlos de Río Negro for several years together with the repeated visits of R. Liesner (Missouri Botanical Garden, St. Louis) has augmented significantly the knowledge of the flora of the region. It is now very likely the best explored area in T. F. Amazonas.

In 1977, the former CODESUR development agency was transferred into the newly created Ministerio del Ambiente y de los Recursos Naturales Renovables (MARNR; Ministry of Environment and Natural Renewable Resources); from then on, the exploration activities, both botanical and zoological, in Territorio Federal Amazonas have been widely advanced by well-equipped base camps at San Juan de Manapiare, Santa Bárbara, Tamatama, and San Carlos de Río Negro, along with efficient airplane and helicopter support. During 1977 to 1981, an intensive botanical-ecological inventory of the savannas and other herbaceous formations in the lowlands of the Territorio was carried out by O. Huber, accompanied by a faunistic (mainly her-

petological) inventory (by J. Cerda) and by a geomorphological-pedological study of the savanna landscape (by A. Zinck). Since 1980, the regional office of MARNR at Puerto Ayacucho has promoted the establishment of a regional herbarium. Its founder and first curator, F. Guánchez, is the botanical resident of MARNR in T. F. Amazonas. He has already made several expeditions to remote places in the Territorio.

During the last two years the botanical exploration of the highest parts of the Duida-Marahuaca massif has been the highlight of the most recent phase of exploration in the Guayana Highland: first by Maguire and Steyermark (January 1981), then by Steyermark and Liesner (February 1981), and finally by Steyermark, Luteyn, Mori, Holmgren, and Guariglia (January to February 1982). A large number of collections from the summit of Marahuaca, including numerous species and three new genera, have resulted from these three expeditions conducted by Brewer-Carias and aided by helicopter transport.

Before concluding this outline, mention also should be made of the numerous plant collections and other contributions made by non-botanists, mainly anthropologists, during their research on the different Indian tribes of the Territorio. Probably the first anthropologist visiting T. F. Amazonas was Theodor Koch-Grünberg, who entered the Territorio in 1913 at the headwaters of the Río Ventuari, homeland of the Makiritare Indians. Although he did not make plant collections, his descriptions of the region are an extremely valuable and useful source of information for any naturalist (Koch-Grünberg, 1917, 1979). Modern anthropological research has increasingly focused on the role of plants in the life of the Indians of these regions. Several studies have been made on ethnobotany in the upper Orinoco and Ventuari region, the most important being those by Lizot, Colchester and Lister, Colchester, Fuentes, and Alès and Chiappino.

GEOGRAPHICAL AND CHRONOLOGICAL SYNOPSIS

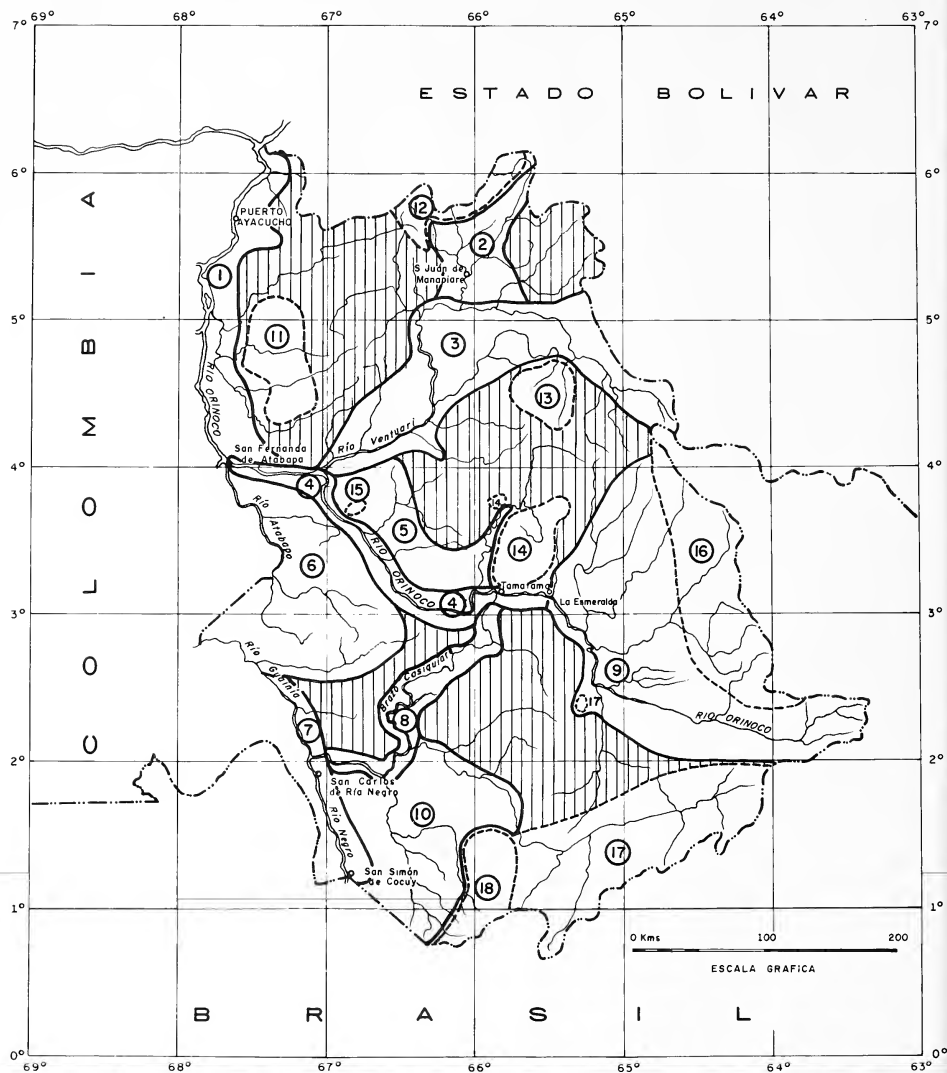
For the purpose of more direct reference, this section cites all the explorations that have taken

place in the Territorio Federal Amazonas during the last two centuries, arranged chronologically. For each expedition, the main geographical areas where plant collections were made are given. Accordingly, the Territorio Federal Amazonas has been subdivided into 18 areas, of which the first ten (1–10) refer to lowlands and the following eight (11–18) refer to uplands (mainly tepuis).

Map 2 shows the delimitation of the 18 geographical areas in the Territorio. Although an attempt has been made to adhere as far as possible to the natural regions of the Territorio, it must be kept in mind that in some cases the areas delimited are rather artificial. For reference convenience, places that have been visited frequently have been united into one area, but without precise indication of the collecting locality. This is particularly true for the riverine vegetation; therefore, the Río Orinoco, which has been visited more or less intensively by almost all collectors, has been subdivided into three main sectors; the Ríos Casiquiare, Ventuari, and Atabapo are each one sector; and the Ríos Guainía-Negro drainage area comprises two sections. Often the limits of the areas coincide with those reached by several expeditions; thus area 4 (Río Orinoco from San Fernando de Atabapo up to Esmeralda) ends at Esmeralda, because a large number of expeditions reached their limits on the Orinoco there.

The chronological sequence (Table 1) begins in 1800 and continues through 31 Dec 1982. Collecting activities that continued for more than a year are cited first by year, dash, blank space, no indication of month (e.g., 1969–); subsequent entries for such continuations are identified by "cont." in the "Year" column. A year followed by a blank space (without indication of month) refers to an expedition started sometime during that year but with the exact date unknown. Month, dash, blank space (e.g., Sep–) indicates that the trip continues through the following year, ending in dash, month (e.g., –Mar). Doubtful date, collector, or place are accompanied by a question mark (?).

The combined chronological-geographical ar-



MAP 2.—Botanical collecting areas in T. F. Amazonas (circled numbers: 1–10 = lowland areas; 11–18 = upland areas; hatching denotes botanically unexplored areas; see p. 20 ff for numbered area definitions).

TABLE 1.—Chronological sequence of botanical exploration in T. F. Amazonas
(for explanations see p. 9 and Map 2).

Year	Month(s)	Collector(s)	Lowlands																Uplands						Notes
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18					
1800	Apr-Jun	Humboldt and Bonpland	x																						
1839	Jan-Mar	Schomburgk																							
1853	Apr-Nov	Spruce																							
	Nov-Dec	Spruce																							
	Dec	Spruce																							
1854	Jan	Spruce																							
	Feb	Spruce																							
	Feb-May	Spruce																							
	Jun	Spruce																							
	Jun-Jul	Spruce																							
	Aug-Nov	Spruce																							
1886	Sep-Dec	Chaffanjon																							
1887	Apr-Sep	Gaillard																							
	Oct	Jahn																							
188?		Bungeroth?																							
1907-	?	Weiss and Schmidt?																							
1908																									
1928	Sep-	Tate																							
	Oct	Luetzelburg																							
1929	-Mar	Tate																							
	Nov-	Holt and Gehrig																							
1930	-Feb	Holt and Gehrig																							
1931	Jan-May	Holt and Blake																							
1935	Sep	Ducke																							
1937	Aug-Sep	Lichy																							
1939	Nov-	Cardona																							
1940	-Apr	Cardona																							
	May-Jun	Williams																							
	Nov-	Cardona																							
	-May	Cardona																							
1941	Jan	Williams																							
	Jan-Feb	Williams																							
1942	Feb-Mar	Williams																							
	Mar-Apr	Williams																							
	Apr-May	Williams																							

x?

x?

TABLE 1.—Continued.

Year	Month(s)	Collector(s)	Lowlands																Uplands						Notes	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
1942	May-Jun	Williams	x																							
	Jun-Jul	Williams																								
1944	Mar	Baldwin																								
	Aug-Sep	Steyermark	x																							
1945	Dec	Froes																								
	Dec	Cardona																								
1946	Feb	Phelps																								
	Apr	Cardona																								
1947	Mar	Phelps et al.																								
	Dec	Schultes and Lopez																								
1948	Nov	Araque Molina and Barkley																								
	Nov-Dec	Cruxent																								
	Nov-	Maguire et al.	x																							
1949	Jan	Phelps et al.																								
	-Mar	Maguire et al.																								
	Apr-May	Maguire and Maguire, Jr.																								
1950	Apr	Curran	x																							
	Apr-Jun	Barnes																								
	Oct	Maguire et al.																								
	Nov-Dec	Maguire et al.																								
1951	Jan	Maguire et al.																								
	Jan-Feb	Maguire et al.																								
	Jan-Feb	Cowan and Wurdack		x																						
	Feb	Cowan and Wurdack																								
	Mar	Maguire																								
	Jul-Sep	Croizat	x																							
	Jul-Sep	Couret																								
1952	May-Jun	Leopold III																								
1953	Jan-Mar	Maguire and Maguire																								
	Mar-Apr	Maguire et al.	x																							
1953	Nov-	Maguire et al.																								
	-Feb	Maguire et al.	x																							
1954	Apr-Sep	Level																								
1955	Dec	Wurdack and Monachino																								
1957	Sep-Oct	Maguire et al.																								
	Oct-	Maguire et al.																								
1958	-Jan	Maguire et al.																								
	Jan-Feb	Vareschi and Mägdefrau	x																							

cryptogams

TABLE 1.—Continued.

Year	Month(s)	Collector(s)	Uplands																		Notes
			Lowlands																		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
cont.		Medina							x												
cont.		Uhl							x												
cont.		Clark, H., and Clark, K.							x												
1981		Brown, Jr.		x	x																
	-Jan	Tillett and Brown, Jr.	x																		
	Jan	Maguire et al.											x								
	Feb	Guánchez																			
	Feb	Huber and Medina																			
	Feb	Steyermark et al.	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	by helicopter	
	Mar	Huber	x																	by helicopter	
	Mar	Liesner et al.		x																	
	Mar-Apr	Christenson et al.							x												
	Mar-Apr	Delascio et al.							x												
	May	Guánchez						x													
	Jun	Huber	x		x	x															
	Jun	Huber and Braun	x																		
	Jul	Guánchez						x													
	Jul-Aug	Castillo	x																		
	Jul-Sep	Molina	x																		
	Aug-	Dezeco							x												
	Oct-Nov	Delascio and Guánchez																			
	Nov	Tillett and Huber	x			x															
	Dec	Coppens		x																	
1981	-Dec	Clark, K.							x												
cont.		Medina							x												
cont.		Uhl							x												
cont.		Clark, H.							x												
cont.		Alés and Chiappino							x												
cont.		Guánchez							x												
cont.		Buschbacher																			
cont.		Romero							x												
1982		Steyermark et al.																			
	Jan-Feb	Guariglia et al.																			
	Jan-Feb	Ortiz and Narbaiza																			
	Feb	Huber																			
	Feb-Mar	Huber																			
	Mar	Guánchez																			
	May-Jun	Tillett and Huber																			
	May-Jun	Huber and Tillett																			

orchids
by helicopter
cryptogams

rangement of the expeditions and collectors in Table 1 should facilitate research concerning the intensity of botanical exploration of a given area, or months (or seasons) less-covered botanically. Generally speaking, the months between November and February/March are the "dry season," whereas the remaining months from April to October/November are the "rainy season." The dry season is more pronounced in the northern part of the Territorio and less in the southwestern portion, where annual mean precipitation reaches 4000 mm, no month having less than 100 mm. (Further climatic information in CODESUR, 1979; Huber, 1982a,b.)

Following are the definitions of the 18 areas delimited in Map 2 and referred to in Tables 1 and 2.

Lowlands (areas 1–10).

1. Río Orinoco from its confluence with the Río Meta in the north to its confluence with the Río Atabapo to the south; this area also includes the lowlands extending east of the river to the base of the Serranía Cuao-Sipapo, including, therefore, the lowland sections of the Ríos Cuao, Autana, Sipapo, and Guayapo. A large part of these lowlands forms the "Reserva Forestal Sipapo" (Sipapo Forest Reserve). The northern section of this area includes the road from Sanariapo (or Samariapo, as it has been recently spelled) to Puerto Ayacucho and north to El Burro (Puerto Nuevo) in front of the mouth of the Río Meta. To the southeast of Puerto Ayacucho the lower valley of the Río Cataniapo, sometimes called Gavilán, also is included. Area 1, as defined here, further includes Isla Ratón and other islands in the Río Orinoco.
2. Basin of Río Manapiare, including the lowland sections of the Río Manapiare, the Río Parucito, and part of the lower Río Asita to the east.
3. Basin of Río Ventuari, from its headwaters at approximately 500 m above sea level to its confluence with Río Orinoco; here included are all settlement areas along the Río Ventuari, such as (downstream to upstream) Kanaripó (south bank), Carmelitas (or Yacuray, older name no longer in use) (south bank), Marueta (southeast bank), Maco (northwest bank), Tencua (north bank), and Cacuri (east bank). Cerro Moriche, located at the western shore of the middle Ventuari, reaches approximately 800 m elevation. Despite its height, it has been maintained here in this lowland area, since its vegetation does not show a marked differentiation of an upland type.
4. Río Orinoco, between the confluence with Ríos Ata-

bapo/Guaviare, and Esmeralda, mainly a riverine area extending approximately 3–5 km on each side of the river. Here also included are the following settlements and their surroundings: Minicio (Minisio), Patacamé, Trapichote, Santa Bárbara, Macurucu, Piedra Blanca, Guachapana (often misspelled, e.g., "Guapuchana" by Foldats), Caridad, San Antonio (including the savanna of San Antonio), Boca Yagua, Puruname, Guaname (or Guanami), Maricapana, Cariche (including the low Cerro Cariche), Trocapure, Maricapure, Tamatama, Punta Piaroa, and Esmeralda.

5. Lowland plains extending between the Río Ventuari (lower course, on the north), Río Orinoco (on the west and south), Río Cunucunuma and Cerro Huachamacari (on the east). These plains are drained by four rivers (from northwest to southeast): Río (or Caño) Yagua, Río Puruname (wrongly indicated on the CODESUR map (1975, 1:1,000,000) as Río Guaname), Río (or Caño) Guaname, and Río Cunucunuma. This area also contains the "Yapacana savannas I, II, and III," located to the west of Cerro Yapacana between the Río Orinoco with its affluent Caño Cotúa (sometimes called Caño Yapacana) and the western edge of Cerro Yapacana. Approximately 20 km to the east of Cerro Yapacana, a small lagoon, Laguna Yagua, with many floating islands, gives rise to one of the upper tributaries of the Río Yagua.
6. Lowland plains extending between the Río Orinoco on the north and east, Caño San Miguel (or Conorochite) on the south, Río Atabapo, Guasacavi, and Guainía on the western border of the T. F. Amazonas with Colombia. This area forms part of the Casiquiare peneplain proper, and is drained by a small river system flowing mainly from east to west or northwest into the Río Atabapo or Río Guainía. These main tributaries are (from north to south): Caño Caname, Río Atacavi, Río Temi, and Río Guasacavi, all affluents of the Río Atabapo; and Caño Pimichín and Caño San Miguel, tributaries of the Río Guainía.
7. Area of the lower Río Guainía and uppermost (Venezuelan) Río Negro, mainly a riverine region, including all major settlements along the Río Guainía (San Miguel, Democracia, Comunidad, Santa Rita), and the Río Negro (San Carlos, Laja Alta, Santa Rosa de Amanadona, Santa Lucía, El Carmen, San Simón de Cocui). This area also includes the region of the mouth of Brazo Casiquiare up to Solano (which is now connected to San Carlos on the Río Negro by a road of about 20 km), as well as the famous Piedra Cocui (Cucuih in Brazilian spelling), an isolated granitic hill near the Venezuelan-Brazilian-Colombian frontier.
8. Brazo Casiquiare (also called Río, Caño, Canal), connecting the Río Orinoco near Tamatama with the Río Guainía and giving rise to the Río Negro. The

TABLE 2.—Botanical exploration of mountains and other upland regions in T. F. Amazonas (for explanations see "Chronological and Geographical Synopsis" and Map 2).

Mountain (Area)	Collectors (Year of trip)
Cerro Aracamuni (18)	Huber & Medina (1981)
Cerro Aracapo (11)	Hermoso (1978)
Cerro A'roko = Parú (13)	
Cerro Asisa = Parú (13)	Hoyos (1973)
Cerro Autana (11)	Steyermark (1971)
Cerro Avispa (18)	Cardona (1972); Dunsterville (1972)
Cerro Calentura = Ualipano (12)	
Cerro Camani (12)	Maguire et al. (1951); Huber (1979)
Cerro Cayenama (16)	Cardona (1971)
Cerro Corocoro (12)	Maguire & Maguire (1953)
Cerro Cuao = Sipapo (11)	
Cerro Duida (14)	Tate (1928–1929); Steyermark (1944); Maguire & Maguire (1949); Barnés? (1950); Maguire et al. (1950); Fariñas et al. (1969); Ferrigni et al. (1975); Tillett et al. (1975); CASUB (1979); Steyermark et al. (1981); Steyermark et al. (1982); Guariglia et al. (1982); Guánchez (1982)
Cerro Fuif = Marahuaca (14)	
Cerro Guanay (12)	Maguire et al. (1951)
Cerro Huachamacari (14)	Maguire et al. (1950); Steyermark et al. (1982); Guariglia et al. (1982)
Cerro Mahedi (16)	Huber (1980)
Cerro Marahuaca (14)	Tillett et al. (1975); Maguire et al. (1981); Steyermark et al. (1981); Steyermark et al. (1982); Guariglia et al. (1982)
Cerro Moriche (3)	Maguire et al. (1951)
Cerro Morrocoy (12)	Matos (1958)
Cerro de la Neblina (18)	Maguire et al. (1953–1954); Maguire et al. (1957–1958); Ewel (1964); Maguire et al. (1965–1966); Steyermark et al. (1970)
Cerro Paraque = Sipapo (11)	
Sierra Parima (16)	Schomburgk (1839); Cardona (1940–1941); Vareschi (1967); Cardona (1971); Steyermark (1973); Colchester (1979–1980); Alès & Chiappino (1980–1982); Huber (1980); Huber (1981, two trips); Guánchez (1982)
Cerro Parú (13)	Phelps et al. (1949); Cowan & Wurdack (1951); Hoyos (1973); Huber (1979, two trips)
Pico Phelps = Neblina (18)	
Cerro Sipapo (11)	Phelps (1946); Maguire et al. (1948–1949); Maguire et al. (1981); Steyermark et al. (1981)
Sierra Tapirapeco (17)	Cardona (1945–1946)
Cerro Ualipano (12)	Cardona (1962); Brewer-Carías (1962)
Sierra de Unturán (17)	Guánchez (1981)
Cerro Vinilla (17)	Huber (1981, two trips)
Cerro Yapacana (15)	Maguire et al. (1951); Steyermark & Bunting (1970); Rogers (1979); Thomas (1979)
Cerro Yaví (12)	Phelps (1947)
Cerro Yutajé (12)	Maguire & Maguire (1953)
Pico Zuloaga = Neblina (18)	

- area includes the river shores from Solano at the lowestmost portion up to near the bifurcation of the Río Orinoco. Important and often-mentioned places and settlements along Brazo Casiquiare are (from southwest to northeast): Piedra Culimacari, Piedra Vanari [Schomburgk] or Guanari, Buena Vista, Quirabuena, Curare, Laguna Pasiba (or Vasiva or Baciba), Deshecho, Capibara (or Capihuara).
9. Area of uppermost Río Orinoco, above Esmeralda to the headwaters of the river. This area also includes the lowlands to the east between the Río Orinoco and the Sierra Parima, drained by the following rivers (from north to south): Río Padamo, which is formed by the tributaries Río Continamo, Río Uotamo (or Botamo), and Río Matakuni; then, further south, Río Ocamo with its main affluents Río Putaco and Caño Jenita; Río Manaviche, and, above Raudal Guaharibos, Río Potomauco (also called Río Orinoquito). From the south, the only major tributary of the upper Orinoco is the Río Mavaca. Important settlements in this area are: Misión Padamo, Ocamo (also called Santa María de los Guaiacas), Mavaca, Platanal (Indian name Mahekodo-teri), and Guabutagüey-teri. Most commonly mentioned rapids ("raudal" or "salto") of the uppermost Orinoco are Raudal Guaharibos (which for a long time has been the chief obstacle hindering further upstream explorations), Raudal Peñascal, and Raudal Arata on the middle Río Ocamo.
 10. Lowland plains in the southwesternmost region of the Territorio. This area is limited on the north by the lower Brazo Casiquiare (area 8), on the east by the Río Siapa and the mountain range of Cerros Neblina, Avispa and Aracamuni, on the southwest by the Venezuelan-Brazilian border, and on the west by area 7 (Río Negro). These extensive lowlands are drained mainly by two rivers, the Río Siapa and Pacimoni (or Pasimoni) formed by the confluence of the Ríos Baria and Yatúa. The only important settlements or often-mentioned older places in this very sparsely populated region are Pueblo Viejo on the lower Pacimoni (no longer existing), San Custodio, and Santa Isabel (former rubber stations visited by Spruce, but also no longer existing). Along the Río Yatúa two granitic hills have been visited repeatedly by botanists: Laja Catipán on the north bank shortly above the confluence with the Río Baria, and Piedra Araucauca on the left bank of the middle Río Yatúa, approximately to the west of Cerro Avispa.
- Uplands (areas 11–18).
11. The massif formed by Cerro Cuao, Cerro Sipapo (or Paraque), Cerro Autana, and Sierra Guayapo including Cerros Aracapo and Ouana (or Ovana).
 12. The mountain range formed by Cerros Guanay, Corocoro, Yutajé, Yaví, and Ualapino (or Cerro Calentura), all located along the border between T. F. Amazonas and Estado Bolívar. Also included here are mountains of lesser altitude to the west of San Juan de Manapiare, such as Cerro Morrocoy and Cerro Camanir.
 13. Cerros Parú (A'roko) and Asisa.
 14. The massif of Cerro Duida, Cerro Marahuaca (or Maragua; or Fui), and Cerro Huachamacari (for detailed Yekuana or Makiritare toponymy see Cuvriex, 1957).
 15. Cerro Yapacana.
 16. Sierra Parima, including the headwater region of the Río Matakuni (Cerro Cayenama, Sabana de Simarawochi or Simadavochi), the Río Ocamo, and the Río Putaco with landing strips of Parima "A" and Parima "B."
 17. The mountainous region bordering the valley of Río Matapire (upper course of Río Siapa): to the north Sierra de Unturán; to the south Sierra Tapirapeco, and Sierra Curupira. Here also is included a low mountain range called Cerro Vinilla, with a small sandstone summit area of about 800 m elevation, on the northern spurs of Sierra de Unturán.
 18. The massif formed by Cerro Aracamuni, Cerro Avispa, Cerro Neblina (from north to south) and Sierra Imeri to the east of Cerro Neblina. On Cerro Neblina, three main peaks have been designated: Pico Phelps (Pico da Neblina in Brazilian toponymy), 3045 m; Pico Zuloaga, 2800 m; and Pico Cardona, 2650 m.

Annotated List of Collectors

The following annotated list of plant collectors is arranged alphabetically and includes all persons cited on the labels of plants collected in the Territorio Federal Amazonas during the period from 1800 to 31 December 1982. A distinction has been made between main and secondary (co-) collectors: those names cited in the first place on the label and whose numbering systems were employed on that particular collection (main collectors) are printed in large and small capitals; the names of others cited on the label (secondary or co-collectors, who accompanied the main collector on that particular trip) are printed in capitals and lower case.

The data cited in the list have been gathered in two different ways: forms were sent to most of the living collectors to obtain complete information on their collecting activities and results in T. F. Amazonas; otherwise, especially for de-

ceased collectors, a serious attempt has been made to reconstruct their collecting itineraries and activities from the labels of their collections deposited at VEN, MER, MERF, MY, MYF, US, and NY, or from pertinent literature. In some cases the forms were not returned in time and in other cases the reconstruction of data from the labels has been more or less unsuccessful, and so the data on collecting activities or itineraries in T. F. Amazonas are missing or incomplete for several collectors.

Generally, the data provided in the list for each main collector are the following:

Last name, given names

Year of birth and death; citizenship at actual time of visit to T. F. Amazonas; profession (institution for which expedition was made).

Period of collecting activity in T. F. Amazonas: itinerary (names of any co-collectors).

Numbers of plants collected during specified period; main herbaria where the Amazonas collections from this period are deposited.

Notes.

Publications related to collector's Amazonas activities or specimens.

"Numbers of plants collected" are indicated in two ways: if preceded by "Nrs." the digits refer to the numbering sequence used by the collector; if followed by "nrs." the digits refer to the total number of plants collected, in cases where the collector's numbering system is unknown or unusable for this study.

In the case of co-collectors, the number of specimens and their herbaria disposition are omitted. The name of the main collector is given (in capitals), to which the reader is referred for further information.

Finally, some general information is included in this list on frequently cited institutions, such as CODESUR, MARNR, IVIC, UCV, etc., in order to explain the meaning of their acronyms and their main activities related to botanical research in T. F. Amazonas.

Adderley, Lincoln

1932-; U.S.; Horticulturist (New York Botanical Garden).

29 May-8 Aug 1959: Middle and upper Río

Orinoco, Río Atabapo, Río Casiquiare, Río Guainía, Río Pacimoni, and Río Siapa (with J.J. WURDACK).

AGOSTINI, GETULIO

1943-; Venez.; Botanist (Instituto Botanico, Caracas).

29-31 Mar 1973: San Juan de Manapiare and surroundings.

Nrs. 1500-1579; VEN, NY, P, MYF.

Notes: Specialist in Venezuelan Boraginaceae and Myrsinaceae. Notebooks of this trip have been lost.

Akkermans, Louis M.A.

1942-; Dutch; Botany exchange student (Univ. of Utrecht, UCV, Fac. de Agronomía, Maracay).

6-19 Jul 1969: Puerto Ayacucho and surroundings, San Fernando de Atabapo and surroundings, Río Atabapo, Yavita, Maroa, Caño Casiquiare (with G.S. BUNTING and J. van Rooden).

ALÈS, CATHERINE

1952-; French; Ethnologist.

Apr 1980-Aug 1982: Sierra Parima, headwaters of Río Putaco and Río Orinoquito, Parima "A" and Parima "B" (with J. Chiappino, joint collections).

Approximately 200 nrs., irregularly numbered; MYF, VEN.

Notes: Anthropological research on Yanomami Indians; also collected living material ("magic" plants, cultivated Yanomami plants) grown later at S. Tillett's home.

Anduze, Pablo J.

1902-; Venez.; Entomologist.

Oct-Nov 1951: Upper Río Orinoco, from confluence with Río Ugueto up to the sources of Río Orinoco.

Notes: Member of the French-Venezuelan expedition to the sources of the Río Orinoco, 1951. Anduze continued the botanical collecting activities after the departure of L. CROIZAT at the confluence of Ríos Orinoco and Ugueto (24 Oct 1951). Nevertheless, the labels of all botanical specimens bear only Croizat's name.

6 Dec 1965-6 Jan 1966: Río Cataniapo, Sa-

mariapo, San Fernando de Atabapo, Santa Bárbara, Tamatama, Río Matacuni, Río Padamo, Río Cuntinamo, Río Casiquiare down to Caño Caripe (with G.C.K. DUNSTERVILLE).

Publication: Anduze, s.d. [1958?].

ARAQUE MOLINA, JORGE

1928-; Col.; Botanist? (Fac. Nac. de Agronomía de Medellín).

24 Nov 1948: San Fernando de Atabapo and vicinity (with F.A. Barkley).

Small set (approximately 150 nrs.?) collected in Venezuela; MEDEL, US, COL.

Notes: Used a compound numbering system, e.g., "18.V.42." "V" possibly represents "Venezuela," definitely not the month. Sometimes cited as Molina & Barkley.

ARENDTS, ERNESTO

1952-; Venez.; Forester (ULA, Fac. de Ciencias Forestales, Mérida).

17-26 Feb 1977: Vicinity of Puerto Ayacucho. Nrs. 06-18; MER, VEN, MYF.

Notes: Exclusively trees.

ARGUMOSA, JOSÉ ANGEL DE

19??-; Venez.; Physician ("Médico Indigenista," Ministerio de Sanidad y Asistencia Social).

21 Apr-12 May 1967: Macapo [Río Cunucunuma], Caño Casiquiare, Río Orinoco, Ocamo, Mavaca, Platanal, La Esmeralda, Tamatama, Caño Cariche, Santa Bárbara (savanna and rapids).

Nrs. 1-122; VEN.

Notes: Also made some later collections (Aug 1967). Notebooks at VEN.

ARISTEGUIETA, LEANDRO

1923-; Venez.; Botanist (Instituto Botánico, Caracas).

Jan 1970: Upper Orinoco, Mavaca (with J. Lizot).

Nrs. 7329-7465 [not confirmed]; VEN.

Notes: Specialist on Venezuelan Compositae and Annonaceae.

Asociación Venezolana Para el Avance de la Ciencia (AsoVAC) [Venezuelan Association for the Advancement of Science]

Jan-Feb 1969: Sponsored the first helicopter

expedition (scientific multidisciplinary) to T. F. Amazonas (Cerro Duida, Esmeralda, upper Orinoco, Canal Casiquiare). See FARIÑAS, MARIO.

Publication: Medina, 1969.

Aymard, Gerardo

1959-; Venez.; Forestry technician (UNEL-LEZ, Guanare, Portuguesa).

20-30 Jul 1982: San Carlos de Río Negro and Solano, Río Negro, lower Casiquiare, upper Pacimoni up to lower Río Yatúa (Parque Nacional "Serranía de la Neblina") (with B. STERGIOS).

BALDWIN, JOHN THOMAS, JR.

1910-1974; U.S.; Botanist (College of William and Mary, Virginia).

2 Mar 1944: Río Negro, at base of Cerro Cucuy.

Small set (50 nrs.?): US, IAN (fide *Index Herbariorum*), NY.

Notes: Member of the "US Rubber Exploring Agency in Brazil" during World War II.

Balick, Michael Jeffrey

1952-; U.S.; Botanist (New York Botanical Garden).

15-17 Jul 1982: Santa Bárbara del Orinoco, Trapichote (with O. HUBER and F. Guánchez).

Notes: Specialist on neotropical palms.

Barkley, Fred A.

1908-; U.S.; Botanist (Fac. Nacional de Agronomía de Medellín).

24 Nov 1948: San Fernando de Atabapo and vicinity (with J. ARAQUE MOLINA).

Notes: Expert on New World Anacardiaceae. Collected widely in Colombia and Argentina (approximately 20,000 nrs. in Colombian collection), also in Guatemala, Iraq, Africa.

BARNÉS, VENTURA

19??-; U.S.; Ornithologist (Puerto Rico?).

Apr-Jun 1950: Base of Cerros Marahuaka, Kushamakári (= Huachamacari; base), and upper Río Cunucunuma.

Approximately 91 nrs. at VEN, NY, [and Puerto Rico?].

- Notes: Expedition sponsored by the United Nations; other participants Marc de Civiex, René Lichy, and Ildefonso Villegas.
Publication: Lichy, 1978.
- Bautista, Jaime
1928-; Venez.; Forestry technician (ULA, Fac. de Ciencias Forestales, Mérida).
17 Jan-15 Feb 1968: San Carlos de Río Negro and vicinity, Río Negro, Piedra Cocuy (with L. RUIZ-TERÁN).
- BERRY, PAUL E.
1952-; U.S.; Botanist (CODESUR, Caracas).
21-29 May 1975: Santa Bárbara del Orinoco, Macurucu, Maraya, Caño Moyo, Caño Guachapana.
Nrs. 501-722, 733-795.
28-30 Jun 1975: Puerto Ayacucho to Samaripapo (with A. GENTRY).
17-24 Sep 1975: San Carlos de Río Negro, road to Solano (IVIC study sites) (partly with C. Uhl and E. Brünig).
Nrs. 1350-1566.
11-13 Oct 1975: Río Manapiare, Terecay to San Juan de Manapiare.
Nrs. 1567-1611.
6-8 Nov 1975: Valle de Manapiare.
Nrs. 1652-1660.
25 Feb-2 Mar 1976: Trapichote [west of Santa Bárbara] (with L. Chesney).
Nrs. 2045-2100, 2110-2129.
29 Feb 1976: San Fernando de Atabapo.
Nrs. 2101-2109.
24-29 May 1976: Mouth of Río Ventuari, Piedra Blanca, Macurucu, Trapichote.
Nrs. 2133-2198.
18-20 Jun 1976: West of Caño Seje [valley of Río Manapiare].
Nrs. 2206-2262.
23 Jun 1976: Yutajé.
Nrs. 2263-2271.
25 Jun 1976: Chirinos [Río Parucito, valley of Río Manapiare].
Nrs. 2272-2275.
26 Jun 1976: Pozo Carlina [west of San Juan de Manapiare, near Cerro Morrocoy].
Nr. 2276.
11 Jun 1977: Road to Gavilán [valley of Río Cataniapo, southeast of Puerto Ayacucho] (with J.A. STEYERMARK, O. Huber, and P. Redmond).
12 May 1978: Riverine forests around Santa Bárbara del Orinoco (with J.A. STEYERMARK, O. Huber, and P. Redmond).
Notes: All collections are deposited at MYF, VEN, MO.
Publication: Berry, 1976.
- Blake, Emmet Reid
1908-; U.S.; Ornithologist.
Nov 1930-May 1931: Río Negro, Brazo Casiquiare, Río Orinoco, Cerro Yapacana, Puerto Ayacucho (National Geographic Society Venezuela-Brazil expeditions, Manaus to Ciudad Bolívar, Sep 1930-Jun 1931) (with E.G. HOLT).
- BLANCO, CARLOS A.
1940-; Venez.; Forester (Instituto Botánico, Caracas).
May 1971: Reserva Forestal del Sipapo.
Nrs.
1085-1136: Campamento Laja de Garza.
1137-1170: Left bank of Río Sipapo, Block I.
1171-1201: Right bank of Río Sipapo.
1202-1225: Block II.
1226-1240: Margins of Río Sipapo.
1241-1265: Margins of Caño Guaca, affluent of Río Sipapo.
1266-1270: Río Cuao, Raudal del Danto.
1271-1290: Río Cuao between mouth of Río Sipapo and Raudal Danto.
1291-1292: Margins of river [Cuao?].
Notes: All collections are deposited at VEN.
- BONPLAND, AIMÉ JACQUES ALEXANDRE
1773-1858; French; Botanist.
13 Apr-2 Jun 1800: Río Orinoco, Río Atabapo, Yavita, Caño Pimichín, Río Guainía, San Carlos de Río Negro, Caño Casiquiare, Esmeralda, Río Orinoco (with A.V. HUMBOLDT; see Map 4)
- BOSSIO, HIGINIO
1924-; Venez.; Expedition guide for New York Botanical Garden.
1970-1971: Isla Ratón.
Approximately 50 nrs.; VEN, NY?

BRAUN, AUGUST

1921-; Venez.; Horticulturist (Jardín Botánico, Caracas).

Jan 1964: Puerto Ayacucho, Río Orinoco to San Fernando de Atabapo and Platanal. Few nrs.; VEN.

16 Jun 1981: Puerto Ayacucho and surroundings (with O. HUBER).

Notes: Specialist on Venezuelan palms.

BRETELER, F.J.

1932-; Dutch; Forestry botanist (Instituto Forestal Latino Americano (IFLA), Mérida).

16-30 Nov 1965: Isla Ratón, Lower Río Sipapo.

Nrs. 4688-4891; WAG, VEN, US, U, NY.

BREWER-CARIAS, CHARLES

1938-; Venez.; Explorer, dentist.

Aug 1962: Cerro Ualipano (C. Calentura, upper Parucito Valley).

Approximately 30 nrs.; VEN.

10-20 Oct 1970: Sierra de la Neblina (with J.A. STEYERMARK).

20-22 Sep 1971: Cerro Autana (with J.A. STEYERMARK).

Sep 1980: Laguna Autana [Laguna "Leopoldo"].

Few bromeliads; VEN.

15 Jan 1981: Cerro Marahuaca, Cerro Sipapo (with B. MAGUIRE, C. Maguire, and J.A. Steyermark).

15-17 Feb 1981: Ocamo to Esmeralda, Cerro Marahuaca, Cerro Duida, Cerro Sipapo, Puerto Ayacucho (with J.A. STEYERMARK and R. Liesner).

28 Jan-10 Feb 1982: Río Cunucunuma to Culebra, northern slopes of Cerro Duida, Cerro Marahuaca, Cerro Huachamacari (with J.A. STEYERMARK, J. Luteyn, N. Holmgren, S. Mori, and M. Guariglia).

Notes: For botanical results of Brewer-Cariás' Amazonas expeditions, see STEYERMARK.

Publications: Brewer-Cariás, 1976 (expedition to Cerro Autana), 1978 (Cerro de la Neblina).

Broome, C. Rose

1939-; U.S.; Botanist (U.S. Department of Agriculture).

21 Mar-20 Apr 1981: San Carlos de Río Negro and vicinity (with G.M. CHRISTENSON and F. Delascio).

BROWN, KEITH S., JR.

1938-; U.S.; Entomologist, biogeographer (Univ. de Campinas, Brazil).

22 Dec 1980-21 Jan 1981: Upper Río Ventuari (Técua, Caño Negro, Maco), San Juan de Manapiare, Puerto Ayacucho.

11 nrs.; MYF.

5-6 Jan 1981: Puerto Ayacucho and surroundings (with S. TILLET).

Notes: Voucher specimens for entomological and ecological observations.

BRÜCHER, HEINZ

19??-; Germ.; Botanist (UCV, Fac. de Ciencias, Caracas).

May 1966: Esmeralda.

1 specimen (*Pitcairnia patentiflora*) in VEN.

BRÜNING, EBERHARD F.

1926-; Germ. and Brit.; Forester (World Forestry Institute, Hamburg, West Germany).

Aug-Nov 1975: San Carlos de Río Negro and vicinity (IVIC study sites; mainly Amazon Caatinga, High Forest and Bana).

Nrs. VEN 1-VEN 371; VEN.

Notes: Responsible for forest inventory of the study sites around San Carlos de Río Negro as part of the MAB-UNESCO-IVIC research project. A portion of the collections has been lost.

Budowski, Gerardo

1925-; Venez.; Agronomist, silviculturist.

23 Jan-17 Feb 1951: Cerro Guanay, Cerro Camani (with B. MAGUIRE, W.H. Phelps, Jr., K.D. de Phelps, and C.B. Hitchcock).

BUNGEROTH, E.

18??-1937; Germ.; (?).

1886-1893(?): Collected orchids in T. F. Amazonas (San Fernando de Atabapo).

Notes: Cited by Couret, 1982a,b.

BUNTING, GEORGE S.

1927-; U.S.; Botanist (1953-1954: New York

- Botanical Garden; 1969–1970: UCV, Fac. de Agronomía, Maracay).
- 7 Nov 1953–18 Feb 1954: Río Orinoco, Río Atabapo, Río Casiquiare, Río Guainía, Río Pacimoni, Río Yatúa, Cerro Neblina (with B. MAGUIRE and J.J. Wurdack).
- 6–19 Jul 1969 (with L.M.A. Akkermans and J. van Rooden):
Nrs.
3450–3569, 4124–4125: Puerto Ayacucho-Samariapo.
3571–3592: Río Orinoco, San Pedro. [3593–3623: Colombia].
3624–3630: Río Orinoco, between San Pedro and San Fernando de Atabapo.
3631–3649, 3674–3682: Río Orinoco, Síquita.
3650–3663: Río Atacavi.
3664–3673, 4123: Río Temi.
3683–3895, 3981–3984, 4018, 4109–4118: Vicinity of Yavita.
3896–3909: Yavita-Pimichín road.
4019–4059: Río Temi, near Yavita.
3910–3980, 4120–4122: Yavita-Maroa road.
3985–4015, 4097–4108: Río Guainía, vicinity of Maroa.
3986, 3990, 4016, 4017: Pimichín.
4060–4096: Caño Pimichín.
4126–4147: Vicinity of San Carlos de Río Negro.
MY, U, VEN.
28–30 Dec 1969:
Nrs.
4226–4236, 4256–4280: Puerto Ayacucho to Samariapo.
4237–4255: Río Orinoco, between Samariapo and a place 3 hours upstream.
MY, VEN.
8 Apr–8 May 1970: Río Pacimoni, Río Yatúa, Río Casiquiare, San Carlos de Río Negro, Maroa, Pimichín, Río Atabapo, Caño and Cerro Yapacana (with J.A. STEYERMARK).
11 May 1970: Puerto Ayacucho.
Nrs. 4287–4292.
MY, VEN.

- Notes: Specialist on Venezuelan Araceae.
- BUSCHBACHER, ROBERT
1954– ; U.S.; Plant ecologist (Univ. of Georgia, Athens, Georgia).
1 Jul 1980–present: San Carlos de Río Negro and vicinity (IVIC study sites).
Nrs. 6, 10, 19, 22, 28, 39, 46–61, 71–73; VEN, MO.
Notes: Research on pasture management in tropical forest; botanical collections are related to this research.
- Camico, J.
19??–; Venez.; Field assistant (CODESUR-MARNR, Zone 10, Puerto Ayacucho).
Apr 1978: Río Orinoco, San Fernando de Atabapo, Santa Bárbara (with G. MORILLO and N. Suárez).
CAMPOS, RÉGULO
19??–; Venez.; Resident of Esmeralda?
Nov–Dec 1966: Esmeralda
Approximately 20 nrs.; VEN, NY?
Canales, Hector
1952–; Chil.-Venez.; Forester (CODESUR-MARNR, Zone 10, Puerto Ayacucho).
25 Jan–1 Feb 1977: San Juan de Manapiare and surroundings (with O. HUBER).
Publications: Chesney, 1979; Canales and Catalán, 1981.
- CARABOT C., ALFREDO
1939–; Venez.; Pharmacist (ULA, Fac. de Farmacia, Mérida).
Jun 1980: Puerto Ayacucho and surroundings, Gavilán (with A. Morales).
Approximately 50 nrs.; MERF.
Notes: Plant collections made for pharmacological screening at Fac. de Farmacia, ULA, Mérida.
Publication: Carabot and Usabillaga, 1981.
- CARDENAS DE GUEVARA, LOURDES
19??–; Venez.; Botanist (UCV, Fac. de Agronomía, Maracay).
9 Jan 1978: Puerto Ayacucho and surroundings (with O. Huber and M. Pyykkö).
Nrs. 2684–2685A–D; MY.
5–10 Jan 1978: Puerto Ayacucho and sur-

roundings (with O. HUBER and M. Pyykkö).

Notes: Specialist on Venezuelan Mimosoideae. CARDONA PUIG, FÉLIX

1903–1982; Venez.; Explorer, geographer.

Notes: Due to the significance of this famous explorer of the Venezuelan Guayana region, the following account, taken from Cardona's personal notes, indicates with more detail than usual his itineraries in Venezuelan Amazonas.

Oct 1929–Jan 1930: Accompanied the Venezuelan Frontier Commission to Ríos Orinoco, Casiquiare, and Negro down to Piedra Cocuy [must be the same expedition joined by Holt and Gehrig of the National Geographic Society; Cardona did not collect plants on this expedition].

Nov–Dec 1930: Entered the headwaters of Río Ventuari (Antauare) proceeding from the upper Río Erebató passing over Cerro Uemachú (dividing range between the Río Erebató and the Río Ventuari basins). At the beginning of Dec 1930 reached Raudal de Uraca (del Mono) on the upper Río Ventuari; about the middle of Dec 1930 reached Yakurai (Las Carmelitas) on the lower Ventuari; continued to the Ríos Orinoco, Casiquiare and Negro, where he joined again the Venezuelan Frontier Commission [including Holt and Blake of the National Geographic Society], with which he returned to Maypures in Jan 1931 [no plants were collected by Cardona on this expedition].

Apr 1938–Jul 1942: Félix Cardona filled the appointment as "Jefe de exploraciones en la Oficina de Fronteras," Ministerio de Relaciones Exteriores. During this period he made the following two expeditions in T. F. Amazonas:

Nov 1939–Apr 1940: Upper Ventuari, Sabana del Oso, 300 m.

Nrs. 356–364 (12 Mar 1940); upper Ventuari to Caura, 760 m.

Nr. 365 (5 Mar 1940).

Nov 1940–May 1941: Orinoco, Ventuari, con-

tact zone between Sierra Parima and Sierra Pacaraima, along Sierra Parima to the south (Cerros Caransacá, Arajame, Cadimani), headwaters of Río Ocamo.

Nrs. 151–154, 156–162 (Sabanas Budare, upper Ventuari, 300 m, 15 Nov 1940).

Nrs. 150, 155, 163–167 (upper Ventuari, Río Jenete, 500–600 m, Dec 1940).

[Note irregular numbering of collections on these two expeditions.]

Jul–Dec 1942: Expedition to Orinoco, Ventuari, Salto Ekenkua [Ténua], Río Kaná (right tributary of Río Ventuari), Cerro Manacha [Manaca] (height-of-land between headwaters of Río Ventuari and Río Erebató).

[No plants collected on this expedition by Cardona.]

Sep 1944–Nov 1945: Employed by an American company for rubber exploitation in the Orinoco-Casiquiare region.

Dec 1945–Jun 1946: Joined the Venezuelan-Brazilian Boundary Commission in their expedition to Río Amazonas, Río Negro, headwaters of Río Padauri (Brazil), and Río Siapa (or Matapiri, Venezuela).

Nrs.

[1251–1314: Río Padauri, Brazil, Jan–Feb 1946].

1315–1369: Headwaters of Río Siapa, 550 m, 11 Mar 1946.

[1370–1446: Río Castanho, Brazil, 16–24 Feb 1946.]

1447–1521: Brazilian-Venezuelan frontier, Post 4, 1260 m; Río Vasiva, 55 m; Post 2; Post 3; Feb 1946.

[Note irregular numbering with respect to temporal sequence.]

Jun 1946: Appointed as "Explorador botánico del Departamento de Investigaciones Forestales."

Since 1949 with Cartografía Nacional, División de Geodesia del Ministerio de Obras Públicas (MOP).

Jul–Nov 1951: Member of the French-Venezuelan expedition to the sources of the Río Orinoco.

- Feb 1962: Cerro Ualipano [or Cerro Calentura, upper Parucito valley]
Nrs. 2919–2943.
- Mar 1971: Cordillera Parima, summit of Cerro Cayenama, frontier with Brazil (3°58'N, 64°40'W, 1750 m).
Few nrs., among them nr. 3077 (= *Escobedia parimensis* Pennell, new species).
- Dec 1972: Summit of Cerro Avispa, Río Siapa (approximately 1°30'N, 65°51'W, 1510 m) (with G.C.K. and E. Dunsterville).
Few nrs. [s.n.].
- Cardona's collections have been distributed to US (more than 1200 nrs. up to 1965); other sets in VEN, NY.
- Notes: Referring to Cardona, Prance (1971) cites: "Amazonas, Upper Río Negro, Río Padauri, 1943" [instead of 1946].
- CASTILLO, ANÍBAL
1950–; Venez.; Botanist (UCV, Fac. de Ciencias, Caracas).
- 9–14 Mar 1978: Puerto Ayacucho and vicinity (Gavilán, Paria Grande, Tobogán de la Selva, Parhueña).
Nrs. 735–833; VEN.
- 23 Jul–5 Aug 1981: Puerto Ayacucho to Samariapo and vicinity; Río Cataniapo.
Nrs. 1200–1461; VEN.
- 2–6 Aug 1982: Puerto Ayacucho and vicinity.
Nrs. 1510–1552; VEN.
- Catalán, Américo
1947–; Chil.; Forester (MARNR, Zone 10, Puerto Ayacucho).
- Nov 1977: Reserva Forestal Sipapo (with G. MORILLO).
- Jul 1978: Gavilán, valley of Río Cataniapo (with O. HUBER).
- Publication: Catalán, 1980.
- Centro de Actividades Subacuáticas de la Universidad de Oriente, Cumaná (CASUB).
26 Jan–13 Feb 1979: Esmeralda and surroundings; southern slopes of Cerro Duida up to approximately 1500 m.
Approximately 300 nrs., deposited at UDO, Cumaná.
- [Information furnished by Freddy R. Navarro P.]
- Cerda, Julio
1945–; Chil.; Zoologist (CODESUR-MARNR, Caracas).
- Jan 1977–Jun 1982: Different localities in lowland savannas of T. F. Amazonas, Cerro Parú (with O. HUBER).
- CHAFFANJON, JEAN
1854–1913; French; Explorer, botanist.
- Apr–Dec 1886: Upper Orinoco up to Raudal Guaharibos.
9 Apr: Arrived at Ciudad Bolívar.
17 Sep: Between mouth of Río Meta and Atures.
19 Sep: Arrived at Atures.
1 Oct: Leave for Maypures.
12 Oct: Entering San Fernando de Atabapo.
2 Nov: Leave San Fernando de Atabapo.
4 Nov: Piedra Minisio.
5 Nov: Patacame.
6 Nov: Estuary of Ventuari.
7 Nov: Leave Santa Bárbara.
9 Nov: Isla Perro de Agua.
15 Nov: Front of Cerro Yapacana.
17 Nov: Río Puruname.
18 Nov: Isla Guanami.
20 Nov: Caño Ticanamori.
21 Nov: Cariche.
24 Nov: Junction Orinoco-Cunucunuma; up the Cunucunuma to Aramari's village above Raudal Chipirina.
29 Nov: Back to the Orinoco.
30 Nov: Bifurcation Orinoco-Casiquire.
- 1 Dec: Esmeralda.
2 Dec: Caño Iguapó.
5 Dec: Isla Chiguire, Boca del Río Padamo.
7 Dec: Piedra Mapaya.
8 Dec: Boca Río Mavaca.
9 Dec: Caño Manaviche.
13 Dec: Raudal Guaharibos.
18 Dec: "Sources" of the Río Orinoco.
- Notes: Chaffanjon's main set of plants is deposited at P (apparently 565 nrs. from Venezuela), where the specimens have been studied by Maury, published in *Journal Botanique du Paris*, 1889 [fide Arnal, 1943].
Publication: Chaffanjon, 1889.

Chesney L., Luis

1944- ; Chil.-Venez.; Forester (CODESUR, Caracas).

26 Feb-2 Mar 1976: Trapichote west of Santa Bárbara del Orinoco (with P. BERRY).

Publications: Eden and Chesney, 1977; Chesney, 1979.

Chiappino, Jean

1939- ; French; Physician, anthropologist.

Apr 1980-Aug 1982: Sierra Parima, headwaters of Río Putaco and Río Orinoquito (with C. ALÈS).

CHRISTENSON, GUDRUN M.

1923- ; U.S.; Botanist (U.S. Dept. Agric.).

21 Mar-20 Apr 1981: San Carlos de Río Negro and vicinity.

Nrs. GMC-1375-1420 (24 Mar-8 Apr 1981).

Nrs. GMC-1426-1445 (10-15 Apr 1981) (with C.R. Broome and F. Delascio).

Nrs. GMC-1421-1425 (10 Apr 1981) (with K. Ennis Clark, Caño Marimajari, south of San Carlos); VEN, NA.

Notes: Bulk samples of plants for Anti-Cancer Screening Program of the Cancer Chemotherapy National Service Center, National Cancer Institute. Collected also duplicate bulk samples for parallel Venezuelan research.

CLARK, HOWARD LAMAR

1941- ; U.S.; Botanist (Univ. of Georgia, Athens, U.S.A.; IVIC, San Carlos de Río Negro).

11 Nov 1977-Dec 1982: Resident botanist in San Carlos de Río Negro from 1977 to 1981. Majority of collections were between San Carlos de Río Negro and Solano, also flooded forest collections ("re-balse" forest) within 40 km of San Carlos on Ríos Negro, Guainía, and Casiquiare. One short trip to Maroa, near town. One day (helicopter trip) to Río Yatúa near mouth into Río Pacimoni (approximately 1°30'N, 66°25'W, Apr 1980). Botanical collections continued to be made by trained workers until end of Dec 1982.

Nrs. 6402-8312 (until Sep 1982) (included some other collections outside of T. F. Amazonas); VEN, MO, NY, pers. herb. at Athens, Ga.

Publication: Clark and Liesner, in prep.

CLARK, KATHLEEN [nee Ennis]

1947- ; U.S.; Ichthyologist (Univ. of Georgia, Athens, U.S.A.).

Nov 1977-Dec 1982: San Carlos de Río Negro and surroundings.

Approximately 30 nrs. as main collector.

Approximately 30 nrs. as co-collector with H. CLARK; VEN, NY.

Publication: K. Clark, in press.

COLCHESTER, MARCUS E.M.

1953- ; Brit.; Ethnobiologist, social ecologist.

Sep 1975-Aug 1976: Río Ventuari upstream from Las Carmelitas [Yacurai], middle and upper Ventuari basin, Río Manapiare basin (with J.R.A. Lister, joint collections).

Approximately 1350 nrs. (nrs. 1-750 approximately, under Lister & Colchester; nrs. 2001-2700 approximately, under Colchester & Lister); MYF, K, VEN, St. Bartholomew's Medical College, London.

Notes: "Proyecto Ventuari," supported by CODESUR and UCV, Caracas. Ethnobotanical research on Guahibo, Hohontu, Hoti, Makiritari, Piara, Sanemá, and Yavarani Indians.

Publications: Colchester and Lister, ms; Colchester, ms.

Apr 1979-Nov 1980: Headwaters of Río Ventuari and of Río Erebató.

Nrs. 3000-3500 approximately, with gaps of approximately 200 nrs.; MYF, K, VEN.

Notes: Ethnobiological research on Sanemá Indians.

Publications: Colchester, 1982, in press.

Colvée, Pablo

1943- ; Venez.; Geologist (CODESUR, Caracas).

2-9 Feb 1975: Cerro Marahuaca (with S. Tillet).

Comisión para el Desarrollo del Sur de Venezuela (CODESUR)

1969–1979.

Government development agency established 3 Jul 1969 and attached to the Ministerio de Obras Públicas (MOP). Originally implemented to develop the natural resources of T. F. Amazonas and adjoining Distrito Cedeño of Estado Bolívar, and subsequently to initiate major settlement policies in the region. After 1975, emphasis was focused on basic research relating to the natural resources included in T. F. Amazonas. In April 1977, CODESUR was transferred to the newly created Ministerio del Ambiente y de los Recursos Naturales Renovables (MARNR), where it became known as “Oficina para Estudios Especiales en la Región sur.” CODESUR ceased its activities by 31 December 1979; its functions have been taken over partially by the regional office of MARNR in Puerto Ayacucho (“Zona 10” of MARNR).

COPPENS, WALTER

1937–; Belgian; Anthropologist (Fundación La Salle, Caracas).

8–19 Dec 1981: Basin of Río Manapiare, lower Parucito Valley, Majagua and Caño Majagua, vicinity of Hato “Yaví.”

Nrs. 101–115; MYF.

Notes: Ethnobotanical study of Hoti, Panare, and Yabarana Indians.

26 Nov–15 Dec 1982: Basin of Río Manapiare, lower Parucito Valley, Caño Majagua, Caño Culebra, Caño Mosquito.

Nrs. 01–55; MYF.

Notes: Ethnobotanical and general collections among Hoti and Panare Indians. Numbering is not in chronological sequence.

CORTÉZ, ÁLVARO OMAR

1941–1983; Venez.; Ichthyologist (UCV, Fac. de Ciencias, Caracas).

Feb–Mar 1973: San Fernando de Atabapo, Caño Temi, Río Atacavi, Río Guasacavi, Río Atabapo, Río Orinoco, Río Ventuari

up to Canaripó [Caño Guapuchí, right affluent of the lower Río Ventuari].

Approximately 100 nrs. collected, but apparently only few labeled and mounted, deposited at VEN.

Notes: Limnological-ichthyological expedition of CODESUR-UCV, Facultad de Ciencias-Ministerio de Agricultura y Cría (MAC) to white- and black-water rivers.

COURET, PIERRE

1923–1982; French-Venez.; Pharmacist, biochemist, orchidologist.

Jul–Oct 1951: Esmeralda–upper Río Orinoco up to the confluence with Río Ugueto.

Notes: Botanist of the French-Venezuelan expedition to the sources of the Río Orinoco; botanical collections apparently made in cooperation with L. Croizat. According to Couret (1966:6), his botanical emphasis was on cryptogams, which he sent to P for study. Grelier (1957:129) cites Couret collecting plants on top of Guaharibo range on 28 Aug 1951.

1958: Expedition to the Río Ventuari, for the Ministerio de Sanidad y Asistencia Social (MSAS) [Ministry of Health].

1970: Expedition to the Río Ocamo.

Notes: No plant collections from these two expeditions were seen by us.

Publications: Couret, 1966; 1982a,b.

COWAN, RICHARD SUMNER

1921–; U.S.; Botanist (New York Botanical Garden, NY).

2 Nov 1950–21 Jan 1951: Cerro Duida, Cerro Huachamacari, Cerro Yapacana, Cerro Moriche (with B. MAGUIRE and J. J. Wurdack).

31 Jan–21 Feb 1951: Cerro Parú (Asisa) (with J.J. Wurdack).

Nrs. 31,352–31,599; NY, VEN.

21–23 Feb 1951: Santa Bárbara del Orinoco (with J.J. Wurdack).

Nrs. 32,000–32,087; NY, VEN.

Notes: Member of the “New York Botanical Garden’s Exploration Program of the Flora of the Guayana Highland,” during

1950–1951 (see Map 5). Specialist on New World Leguminosae.

Publication: Maguire, 1964a,b.

CROAT, THOMAS

1938–; U.S.; Botanist (Missouri Botanical Garden, St. Louis).

14 Aug 1982: Puerto Ayacucho and surroundings (lower portion of the valley of Río Cataniapo).

Nrs. 55,037–55,070A; VEN, MO.

Notes: Specialist on neotropical Araceae.

CROIZAT CHALEY, LEÓN

1894–1982; Venez.; Botanist.

Jul–Oct 1951; Esmeralda–upper Río Orinoco up to the confluence with Río Ugueto.

Approximately 1200 nrs.; NY, VEN, P?

Notes: Botanist of the French-Venezuelan expedition to the sources of the Río Orinoco. Specialist on Euphorbiaceae, Cactaceae.

Publications: Anduze, s.d. [1958?]; Couret, 1966.

CRUXENT, JOSÉ MARÍA

192?–; Venez.; Archaeologist (Museo de Ciencias Naturales, Caracas).

Nov–Dec 1948: Lower Río Cuao, Río Autana, base of Cerro Autana.

Nrs. 1–75; mainly VEN.

Notes: Participated also in the following expeditions to T. F. Amazonas:

French-Venezuelan expedition to the sources of the Río Orinoco, Jul–Dec 1951;

Expedition "Elata" with King Leopold III of Belgium, May–Jun 1952.

No plant collections made by Cruxent on these two expeditions have been seen by us.

Publications: Cruxent and Kamen-Kaye, 1949–1950; Evans et al., 1959; Cruxent, 1961.

CURRAN, HUGH M.

1875–1960; U.S.; Forester.

Mar–Apr 1950: Puerto Ayacucho, San Fernando de Atabapo, Santa Bárbara, San Antonio, Culebra [on Río Cunucunuma?].

Approximately 300 nrs.? NY? Wood samples at MAD?

Notes: Curran apparently used two different numbering systems during this trip, because some plants bear low numbers (between 50 and 260 approximately), whereas others bear higher numbers (around 1700–1800). We have been unable to trace Curran's field notes or other pertinent informative sources.

Publication: Obituary in *Journal of Forestry* (Washington) 59(1): 56. 1961.

DAVIDSE, GERRIT

1942–; U.S.; Botanist (Missouri Botanical Garden, St. Louis).

Oct–Nov 1971: Puerto Ayacucho, Samariapo. Nrs. 2735–2882; MO, VEN.

12–21 Apr 1978: Puerto Ayacucho to Samariapo, Puerto Ayacucho to El Burro (Puerto Nuevo) (with O. Huber).

Nrs. 14,880–15,458; MO, VEN.

24 Apr–10 May 1979: Puerto Ayacucho and surroundings, Río Orinoco, San Fernando de Atabapo, Río Atabapo, Caño Caname, Río Atabapo, Río Orinoco, Santa Bárbara, west base of Cerro Yapacana, Caño Yagua (with O. Huber and S. Tillett).

Nrs. 16,742–16,819, 16,849–17,503; MO, VEN. [16,820–16,848 = Colombian shore of lower Río Atabapo].

9–15 May 1980: Puerto Ayacucho and surroundings, Gavián, valley of Río Cataniapo (with J.A. STEYERMARK and F. Guánchez).

Notes: Specialist on neotropical Gramineae.

DELASCIO CHITTY, FRANCISCO

1950–; Venez.; Botanist (Instituto Botánico, Caracas).

21 Mar–20 Apr 1981: San Carlos de Río Negro and vicinity, Piedra Culimacare, confluence Río Pacimoni with Río Casiquiare (with G.M. Christenson and C.R. Broome).

Nrs. 9283–9708; VEN, MY, LaSalle (Caracas).

24 Oct-4 Nov 1981: Santa Bárbara del Orinoco, Macuruco, Canaripó, Las Carmelitas, Caño Yureba up to Salto Yureba, lower Río Ventuari (with F. Guánchez).

Nrs. 10,638-11,051; VEN, MY, Instituto Universitario Pedagógico (Caracas), La-Salle (Caracas), Regional Herbarium at MARNR, Zone 10 (Puerto Ayacucho).

DEZZEO ALDANA, NELDA

1957-; Venez.; Forester (IVIC, San Carlos de Río Negro).

Aug 1981-Dec 1982: San Carlos de Río Negro and vicinity.

Approximately 200 nrs.; MER, VEN.

Notes: Resident forester at IVIC study site in San Carlos de Río Negro succeeding H. Clark. Plant collections from the research area, mainly trees of Amazon "caatinga," "Yévaro" (*Eperua*) forests on laterite, "Bana" scrub.

Publication: Dezzeo and Buschbacher, in press.

DESSLER, ROBERT

1927-; U.S.; Botanist (Smithsonian Tropical Research Institute (STRI) Balboa, Panama).

24-27 Apr 1967: Puerto Ayacucho and surroundings (El Porvenir, Galipero).

Few nrs., mainly orchids. VEN, STRI?, PMA?

Dryer, ?

?-?

Dec 1958: Upper Ventuari (with T. LASSER).

Dubroeuq, Didier

1942-; French; Soil scientist (ORSTOM, Paris; MARNR, Caracas).

Mar 1977: Region of Santa Bárbara del Orinoco (with F. HERMOSO).

DUCKE, ADOLPHO

1876-1959; Braz.; Botanist (Jardim Botânico, Rio de Janeiro).

23 Nov 1935: Piedra Cucuhy, upper Río Negro [wrongly cited as belonging to Brazil].

Few nrs.? MG? RB? US?

DUNSTERVILLE, GALFRID CLEMENT KEYWORTH

1905-; Brit.; Orchidologist.

14-21 Dec 1951: Río Cuao, up to Raudal

Danto and beyond.

5 Jan-28 Feb 1962: Río Ventuari, Manapiare, Río Parucito, Cerro Calentura [= Cerro Ualipano] (with F. Cardona).

6 Dec 1965-6 Jan 1966: Río Cataniapo, Samariapo, San Fernando de Atabapo, Santa Bárbara, Tamatama, Río Matacuni, Río Padamo, Río Cuntinamo, Río Casiquiare down to Caño Caripe (with P. Anduze).

14 Sep-1 Oct 1969: Río Autana [lower course].

6-23 Oct 1970: Cerro de la Neblina (with J.A. Steyermark and C. Brewer-Carías).

20-27 Sep 1971: Cerro Autana (with J.A. Steyermark and C. Brewer-Carías).

27 Nov-15 Dec 1972: Upper Río Siapa, Cerro Avispa (with J. Pantchenko and F. Cardona).

8-18 Jan 1975: Río Autana, up to Caño Manteco.

3-13 Feb 1975: Cerro Duida and Cerro Marahuaca (with S. Tillett and P. Anduze).

Notes: Mr. Dunsterville is a specialist on Venezuelan orchids. His collections are almost exclusively orchids. He does not use a sequential numbering system, because his botanical collections are mainly voucher specimens for drawings. Almost all of his several thousand orchid specimens are preserved in spirits and deposited in his private collection in Caracas and partly in VEN. The above mentioned colleagues are not co-collectors, but accompanying persons on particular expeditions. Mr. Dunsterville was accompanied on most of his expeditions by his wife Eleonore.

EDEN, MICHAEL J.

1936-; Brit.; Geographer (Bedford College, Univ. of London).

Apr-May 1968: San Carlos de Río Negro, Brazo Casiquiare, Esmeralda, Río Orinoco, Santa Bárbara, San Fernando de Atabapo, Isla Ratón, Puerto Ayacucho, middle Orinoco.

Approximately 100 nrs.; K.

Notes: Participant of the "Geographical Magazine Amazonas Expedition by Hovercraft" (Manaus to Port of Spain).

Publications: Eden, 1968, 1971, 1974a.

Aug-Sep 1972: Isla Ratón, lower Río Sipapo basin (Pendare).

Approximately 40 nrs.; VEN.

Notes: Investigation of ecological aspects of indigenous shifting cultivation in the lower Sipapo basin (Piaroa Indians).

Publication: Eden, 1974b.

EWEL, JOHN J.

1941-; U.S.; Plant ecologist (UCV, Fac. de Agronomía, Maracay).

Mar-Apr 1964: Expedition of the Brazilian-Venezuelan Boundary Commission to Cerro de la Neblina:

Nrs.

51-53: Brazo Casiquiare, 21 Mar 1964.

54-60: Brazil, south of Piedra Cocuy, 25 Mar 1964.

61-77: Brazil, Mission of Maturacá, 1 Apr 1964.

78-82: Brazil, Río Cauaburi, 9 Apr 1964. [83: eliminated].

84-86: Brazil, Río Tipirico, 12 Apr 1964.

87-98: Brazil, Río Tipirico, 13 Apr 1964.

99-110: Brazil, Río Tucano, 16 Apr 1964.

111-119: Brazil, ascent to Cerro Neblina, 400 m, 18 Apr 1964.

120-131: Brazil, ascent to Cerro Neblina, 1250 m, 21 Apr 1964.

132-143: Brazil, ascent to Cerro Neblina, 1250 m, 23 Apr 1964.

144-148: Cerro Neblina, Venezuelan-Brazilian frontier, 1700 m, 22 Apr 1964.

149-170: Cerro Neblina, Venezuelan-Brazilian frontier, 1800-2200 m, 25 Apr 1964.

171-185: Cerro Neblina, Venezuelan-Brazilian frontier, 1800-2200 m, 28 Apr 1964.

186-210: Cerro Neblina, Venezuelan-Brazilian frontier, 1500 m, 29 Apr 1964.

211-230: Brazil, Río Cauaburi near mouth into Río Negro, 90 m, Apr 1964.

NY, MY.

Notes: Collections made as part of ecological mapping effort for the "Life Zone Map of Venezuela" (Ewel and Madriz, 1968; Ewel et al., 1976. Field notes in MY. Brazilian collections not mentioned in Prance, 1971.

Publication: Ort, 1965.

FARIÑAS G., MARIO R.

1943-; Venez.; Botanist, ecologist (UCV, Fac. de Ciencias, Caracas).

22 Jan-25 Feb 1969: Esmeralda, Cerro Duida, Brazo Casiquiare (with E. Medina and J. Velásquez).

Nrs. 277-696; VEN, NY, US.

Notes: AsoVAC Expedition to upper Orinoco. Field notes of nrs. 277-526, 530-531 in VEN. First helicopter expedition in T. F. Amazonas.

Publication: Medina, 1969.

FERNÁNDEZ, ANTONIO

1928-; Venez.; Agronomist (UCV, Fac. de Agronomía, Maracay).

25-28 Feb 1977: Puerto Ayacucho and surroundings.

Nrs. 2847-2990; MY.

15-22 Nov 1978: San Simón de Cocui, mouth of Río Guainía and San Carlos de Río Negro, mouth of Río Casiquiare, Río Negro, Maroa, Yavita, Río Temi.

Nrs. 3360-3519; MY.

FERRIGNI, NELSON R.

1943-; Venez.; Pharmaceutical researcher (UCV, Fac. de Farmacia, Caracas).

23-26 Mar 1974: Area of San Fernando de Atabapo (with S. TILLET and A. Gentry).

28 Jan-8 Feb 1975: Surroundings of La Esmeralda, base of Cerro Duida (with C.J. Zorrilla and E.A. Reyes).

Approximately 59 nrs.; VEN, NY, MYF, HB, K, U.

Publication: Norambuena, 1975.

Field, Andy

1955-; Brit.; Student of ecology (Univ. of Reading, England).

8 Nov 1980: Yutajé (with J.A. STEYERMARK, P.J.M. Maas and P. Redmond).

FOLDATS, ERNESTO

1925-; Venez.; Botanist, ecologist (UCV, Fac. de Ciencias, Caracas).

29 Aug-20 Sep 1960: Río Atabapo, Caño Atacavi up to the headwaters.

Nrs. 3526-3887; VEN, NY.

Notes: Joint expedition to blackwater rivers with V. Vareschi and J. Racenis.

18 Apr-14 May 1971: Río Orinoco, Santa Bárbara, Río Ventuari, Salto Ténúa, Río Manapiare, San Juan de Manapiare, Río Ventuari, Río Orinoco, San Antonio, Esmeralda, Platanal, Raudal Guaharibos.

Nrs. 37A-56A: Río Orinoco, Santa Bárbara, 18-21 Apr 1971.

Nrs. 57A-210A: Río Ventuari, San Juan de Manapiare, Río Ventuari, 21 Apr-4 May 1971.

Nrs. 211A-377A: Río Orinoco up to Raudal Guaharibos, 4-14 May 1971.

VEN, NY.

Notes: Expedition made on behalf of CODESUR for the radar inventory of natural resources in T. F. Amazonas (ground control for vegetation mapping) by Aeroservice Corp. The letter "A" after the number refers to "Amazonas." Field notes at VEN. Specialist on Venezuelan orchids.

Publication: Aeroservice, 1972 (including maps 1:250,000).

FROES, RICARDO DE LEMOS

1891-1967; Braz.; Botanist.

11-? Dec 1945: Casiquiare.

Probably few nrs. (less than 100?, e.g., 21,490-21,514: São José do Casiquiare), deposited at IAN, VEN, K, NY, SP, UC, US (fide Prance, 1971).

Notes: Mainly Brazilian collector (with B.A. Krukoff), but made a short trip up the Rio Negro into Venezuela, reaching Brazo Casiquiare in December 1945.

FUENTES, EMILIO

1952-; Venez.; Anthropologist (Fundación La Salle, Caracas).

31 Mar-30 Nov 1978: Lower and middle Río Ocamo up to Raudal Arata (approximately 700 m), mainly at Guabutagüey-

teri (100-1000 m).

Nrs. 1-90, 101-162, 1001-1223; MYF, La Salle (Caracas), P.

1980: Same region as above.

Few nrs. [s.n.]; MYF.

Notes: Anthropological research with Yanomamí Indians. The numbering sequence of collections made in 1978 is irregular.

Publications: Fuentes, ms, 1980.

GAILLARD, ALBERT

1858-1903; French; Botanist, mycologist.

Apr-Sep 1887: Puerto Ayacucho and surroundings, Río Orinoco up to San Fernando de Atabapo, Río Guaviare (Colombia).

Nrs. at least 250.

Notes: The main phanerogamic collections of Gaillard are deposited at P.

Publication: Patouillard and Gaillard, 1888-[1889].

GARÓFALO, BEATRIZ

1953-; Venez.; Botanist (Instituto Botánico, Caracas).

2-3 Aug 1978: Puerto Ayacucho and vicinity (with T. Iturriaga and M. Guariglia).

Nrs. 127-157; VEN.

15 Aug 1980: Galipero [north of Puerto Ayacucho].

Nrs. 475, 477-480; VEN.

Gehriger, Wilhelm

?; ?; ?

Nov 1929-Feb 1930: Río Orinoco, Puerto Ayacucho, Brazo Casiquiare, Río Negro, Cucuhí (Brazil) (with E. G. Holt).

GENTRY, ALWYN

1945-; U.S.; Botanist (Missouri Botanical Garden, St. Louis).

23-26 Mar 1974: San Fernando de Atabapo and surroundings (with S. Tillett and N. Ferrigni).

Nrs. 10,825-10,937; MO, VEN.

28-30 Jun 1975: Puerto Ayacucho to Samariapo (with P. Berry).

Nrs. 14,408-14,644; MO, VEN.

Notes: Specialist on New World Bignoniaceae.

Geographical Magazine Amazonas Expedition by Hovercraft

[11 Apr 1968: Start in Manaus, Brazil].

16 Apr 1968: Cucuí to San Carlos de Río Negro.

17 Apr 1968: Solano.

19–28 Apr 1968: Region of Esmeralda (Río Ocamo, Río Padamo, Brazo Casiquiare).

28 Apr 1968: Esmeralda to Santa Bárbara.

28 Apr–2 May 1968: Region of Santa Bárbara (Río Ventuari, up to Las Carmelitas; Santa Bárbara and vicinity).

2 May 1968: Santa Bárbara to San Fernando de Atabapo.

3 May 1968: San Fernando de Atabapo to Puerto Ayacucho.

6 May 1968: Puerto Ayacucho to Puerto Carreño (Colombia).

[7–9 May 1968: Puerto Carreño, Ciudad Bolívar, Puerto Ordáz, Port of Spain, Trinidad].

Scientific personnel of the expedition:

MICHAEL J. EDEN, geographer, leader of the scientific party.

CONRAD GORINSKY, ethnobotanist.

DAVID HARRIS, geographer, ethnographer.

John B. Thornes, geographer, hydrologist.

ERNESTO MEDINA, plant ecologist.

Notes: All except Thornes collected plants during the expedition.

Publications on the expedition: Botting, 1968a,b; Eden, 1968; Branston, 1970; Medina, 1971.

Publications on scientific results: Harris, 1968, 1971; Gorinsky, 1969; Edwards and Thornes, 1970; Eden, 1971, 1974a,b.

GORINSKY, CONRAD

1936– ; Brit.; Ethnobotanist (St. Bartholomew's Hospital, London).

Apr–May 1968: San Carlos de Río Negro, Brazo Casiquiare, Esmeralda, Ocamo, Puerto Ayacucho.

Approximately 10 nrs., deposited at St. Bartholomew's Medical College, London.

Notes: Participant of the "Geographical Magazine Amazonas Expedition by Hovercraft."

Publication: Gorinsky, 1969.

Griot Casanova, Marcel

19?– ; ? ; Pilot of aircraft of P. Redmond.

22 Feb 1979: Yutajé, Caño Coro-coro (with J.A. STEYERMARK and P. Redmond).

GRUBB, PETER

19?– ; Brit.; Plant ecologist (Univ. of Cambridge, School of Botany, Cambridge, Great Britain).

18–19 Nov 1982: Puerto Ayacucho and surroundings.

4 nrs [s.n.]; VEN, K.

GUÁNCHEZ MEZA, FRANCISCO

1953– ; Venez.; Agronomist, botanist (MARNR, Zone 10, Puerto Ayacucho).

11 Apr 1980–present: Intermittent collections in and around Puerto Ayacucho and vicinity.

9–15 May 1980: Valley of Río Cataniapo (Gavilán, San Pedro); vicinity of Puerto Ayacucho (with J.A. STEYERMARK and G. Davids).

13–28 Feb 1981: Ocamo, upper Río Orinoco, Río Mavaca, Sierra de Unturán, Río Matacuni (by helicopter).

Nrs. 462–899.

18–29 May 1981: Caño Yagua.

Nrs. 1027–1301.

15–17 Jul 1981: Río Atabapo, Caño Atacavi.

Nrs. 1310–1424.

24 Oct–4 Nov 1981: Caño Yureba (with F. DELASCO).

19–30 Mar 1982: Caño Yureba.

Nrs. 1498A–1769 [nrs. 1498–1598 have been erroneously used twice; therefore, one set has been differentiated by the addition of the letter A to the duplicated nrs.].

15–17 Jul 1982: Santa Barbara, Trapichote (with M. Balick and O. HUBER).

12–15 Aug 1982: San Fernando de Atabapo to Tamatama (with L. Mercado).

Nrs. 1837–1937 [mainly secondary vegetation and cultivated plants around all settlements along Río Orinoco; general collections of riverine vegetation].

3–16 Nov 1982: Ocamo (Santa María de los

Guacas) and vicinity; headwaters of Río Padama; 15 km south of Tamatama; Raudal Guaharibo; southern end of Sierra Parima, west of Río Ejército; Raudal Peñascal; south base of Cerro Duida, 360 m; Ocamo; Río Ararí, 2–5 km south of confluence with Río Matapire; Cerro Duida, north ridges, Caño Negro, 750 m (by helicopter).

Nrs. 1950–2353.

All collections: Regional Herbarium of MARNR at Puerto Ayacucho, VEN, MY.

Notes: Resident botanist of MARNR at Puerto Ayacucho since 1979. Founder and curator of the Regional Herbarium of MARNR in Puerto Ayacucho.

GUARIGLIA P., MARIO

1954–; Venez.; Botanist, mycologist (Instituto Botánico, Caracas).

9 Apr 1978–15 Mar 1979: Paria Grande (south of Puerto Ayacucho) (with T. Iturriaga).

Nrs.: 1–524; VEN, NY (mainly fungi).

27 Jan–11 Feb 1982: Culebra, Río Cunucunuma, Cerro Marahuaca, Cerro Duida, Cerro Huachamacari (with J.A. Steyermark, N. Holmgren, J. Luteyn, and S. Mori).

Nrs.: 1376–1796; VEN, NY (bryophytes, fungi, and lichens).

Notes: Helicopter expedition conducted by C. Brewer-Carias.

Publication: Guariglia and Iturriaga, 1980.

GUINAND, LUISA ELENA

1956–; Venez.; Botany student (UCV, Fac. de Ciencias, Caracas).

Oct 1977–June 1978: Puerto Ayacucho and vicinity.

Nrs. 1–117; VEN.

Publication: Guinand and Sánchez, 1979.

Gutiérrez, Luis V.

1938–; Venez.; Chemical technician (UCV, Fac. de Farmacia, Caracas).

27 May–3 Jun 1974: Surroundings of San Fernando de Atabapo, surroundings of Santa Bárbara del Orinoco (with S. TILLET).

HALL, JERRY

1942–; U.S.; Zoologist (Univ. of Georgia, Athens, U.S.A.).

1975–Nov 1977: San Carlos de Río Negro and vicinity (IVIC study sites).

Approximately 30 nrs.; VEN, NY?

HARRIS, DAVID R.

1930–; Brit.; Ethnographer (University College, London).

16 Apr–6 May 1968: Río Casiquiare, Río Orinoco, Río Ocamo, Río Ventuari (Las Carmelitas), Isla Ratón.

Few nrs.; K.

Notes: Member of the “Geographical Magazine Amazonas Expedition by Hovercraft.” Collected mainly cultivated plants used by Indians in their “conucos” (shifting cultivation plots).

Publications: Harris, 1968, 1971.

Hasegawa, Masahisa

1938–; Japan.; Chemist (UCV, Fac. de Ciencias, Caracas).

11–19 Feb 1974: Surroundings of San Fernando de Atabapo (with S. TILLET).

1–9 Feb 1977: San Carlos de Río Negro and vicinity (with G. MORILLO).

Henry, Gustavo

1922–; Venez.

2 Mar 1977: Canaripó (with J.A. STEYERMARK and P. Redmond).

HERMOSO, FREDDY

1948–; Venez.; Soil scientist (MARNR, Caracas).

Mar 1977: Region of Santa Bárbara del Orinoco (with D. Dubroeuq).

1 nr. [s.n.]; VEN.

4 Nov 1978: Cerro Aracapo (upper Río Guayapo).

Few nrs. [s.n.]; VEN.

HERNÁNDEZ RAMOS, JUAN FRANCISCO

1958–; Venez.; Botanist (UCV, Fac. de Agronomía, Maracay).

8–28 Aug 1982: Samariapo, San Fernando de Atabapo, Santa Bárbara del Orinoco, San Antonio del Orinoco, Cariche, Brazo Casiquiare, San Carlos de Río Negro, Piedra Cocuy.

- Nrs. 35-62; MY.
- Notes: Botanical excursion to T. F. Amazonas of members of the Botany Department of UCV, Fac. de Agronomía, Maracay (see also Ruiz Zapata, Thirza).
- HERRICK, L.B.
 ?; ?; ?
 ? : Sierra Parima, Frontier Camp 3, Río Putaco Camp.
 A few orchid collections at VEN [s.n., s.d.].
 Notes: Occasional visitor of the Venezuelan Frontier Commission in May 1972, during J.A. Steyermark's journey in the Sierra Parima (Steyermark, pers. comm.).
- Hitchcock, Charles Baker
 1906-1969; U.S.; Geologist; cartographer (American Geographical Society, New York).
 1-3 Mar 1947: Cerro Yaví (with W.H. and K.D. PHELPS).
 Feb 1949: Cerro Parú (with W.H. and K.D. PHELPS).
 23 Jan-5 Feb 1951: Cerro Guanay (with B. MAGUIRE, W.H. and K.D. Phelps, and G. Budowski).
 12-17 Feb 1951: Cerro Camani (with B. MAGUIRE, W.H. and K.D. Phelps, and G. Budowski).
 Notes: First visit to T. F. Amazonas in 1928-1929 as a member of the Tyler-Duida Expedition to Cerro Duida (see Tate and Hitchcock, 1930).
 Publications: Hitchcock, 1947, 1948.
- Holmgren, Noel
 1937-; U.S.; Botanist (New York Botanical Garden).
 27 Jan-11 Feb 1982: Culebra, Río Cunucunuma, Cerro Marahuaca, Cerro Duida, Cerro Huachamacari (with J.A. STEYERMARK, M. Guariglia, J. Luteyn, and S. Mori).
- HOLT, ERNEST GOLSAN
 1889-1983; U.S.; Ornithologist (National Geographic Society, Washington, D.C.).
 Nov 1929-Feb 1930: Ciudad Bolívar to Cucuhý (Brazil) (with W. Gehriger).
- Botanical collections in T. F. Amazonas:
 Nrs.
 210-217: Puerto Sanariapo, 12 Jan 1930.
 218-227: Mouth of Río Vichada, 13 Jan 1930.
 228-229: Mariposa, Río Orinoco (Colombia), 14 Jan 1930.
 230-232: Near Isla Castillito, 14 Jan 1930.
 233-241: San Fernando de Atabapo, 16 Jan 1930.
 242-245: Santa Bárbara, 18 Jan 1930.
 246-248: Near Caño Cárida, 19 Jan 1930.
 249-252: San Antonio del Orinoco, 21 Jan 1930.
 253-261: Isla Maricapana, 21 Jan 1930.
 262-267: Below Tamatama, 23 Jan 1930.
 268-282: Tamatama, 24 Jan 1930.
 283-290: Casiquiare, Capibara, 25 Jan 1930.
 291-335: San Carlos de Río Negro, 28-29 Jan 1930.
 336-340a: San Felipe (Colombia), 29 Jan 1930.
 341-399: Cucuhý (Brazil), 4-5 Feb 1930.
 400-413: Puerto Ayacucho, 25 Feb 1930.
- Notes: National Geographic Society Venezuela-Brazil expeditions. Some of the labels of these collections bear "N.G.S." as collectors. First set at US; dupl. NY, VEN, B, BM, G, GH, S, CM.
- Publications: Holt, 1931; Friedmann, 1948.
 Sep 1930-Jun 1931: Manaus to Ciudad Bolívar (with E.R. Blake).
- Botanical collections in T. F. Amazonas:
 14-26 Nov 1930: Salto Huá, Río Maturacá (Venezuelan-Brazilian frontier).
 25-30 Jan 1931: Río Negro.
 30 Jan-22 Feb 1931: Río Casiquiare.
 23 Feb 1931: Río Orinoco, Tamatama.
 24 Feb 1931: Río Orinoco, near Cerro Cariche.
 25 Feb 1931: Río Orinoco, Isla Temblador.
 28 Feb-9 Mar 1931: San Antonio del Orinoco.
 12-16 Mar 1931: Río Orinoco, Isla Corocoro.

17–23 Mar 1931: Cerro Yapacana, base camp.

23 Mar–29 Apr 1931: Cerro Yapacana.

8–23 May 1931: Puerto Ayacucho.

Notes: The above itinerary and dates are taken from Friedmann's paper on the ornithological results of Holt's expedition. Bird-collecting sites do not necessarily always correspond to plant-collecting localities. Apparently, Holt and companions were the first naturalists to ascend to the top of Cerro Yapacana (approximately 1200 m). Nevertheless, so far no collections made by Holt have been seen by us from the summit region of that mountain. Possibly, plant collections were made only at the base of Cerro Yapacana. A total of 452 collections of the original set collected by Holt and Blake are deposited at US; duplicates at VEN, NY (and other herbaria as above?). The Venezuelan Amazonas collections made by Holt and Blake cover approximately their nrs. 600–800. Holt and Blake's plant collections made in Brazil are omitted in Prance, 1971.

Publications: Holt, 1933: Friedmann, 1948.

Hoyos F., Jesús

1927–; Venez.; Botanist (Sociedad de Ciencias Naturales La Salle, Caracas).

5–20 May 1973: Caño Asisa, Cerro Parú (La Momia), Laguna Asisa (with G. Morillo).

Nrs. 1–133; La Salle (Caracas), VEN.

Notes: Joint helicopter expedition of Sociedad de Ciencias Naturales La Salle and Instituto Botánico (VEN), Caracas.

Publications: Hoyos, 1973.

HUBER, OTTO (Map 3)

1944–; Ital.; Botanist, ecologist (CODESUR, MARNR, Caracas).

25 Jan–20 Apr 1977:

Nrs. 394–517: San Juan de Manapiare and vicinity, 25 Jan–1 Feb 1977.

Nrs. 518–542: San Juan de Manapiare and vicinity, 24–25 Feb 1977.

Nrs. 547–717: Puerto Ayacucho and vicinity, 13–20 Apr 1977.

4 May 1977: Puerto Ayacucho and vicinity (Tobogán de la Selva) (with J.A. STEYERMARK and P. Redmond).

Nrs. 718–821: Puerto Ayacucho and vicinity, 21–25 May 1977.

11 Jun 1977: Valley of Río Cataniapo (south-east of Puerto Ayacucho) (with J.A. STEYERMARK, P. Berry, and P. Redmond).

17 Jun 1977–13 Apr 1978:

Nrs.

825–863: Puerto Ayacucho and vicinity (partly with J. Cerda), 17–18 Jun 1977.

864–961: Puerto Ayacucho and vicinity, Isla Ratón (with S. Tillett), 14–21 Jul 1977.

962–1051: Puerto Ayacucho and vicinity, 21–25 Aug 1977, 13 Sep 1977.

1052–1254: San Juan de Manapiare and vicinity, 10–18 Oct 1977 (includes a short helicopter trip to Canaripó (1062–1079, 11 Oct 1977) and southeastern base of Cerro Yaví (1080–1088, 12 Oct 1977)).

1255–1377: Puerto Ayacucho and vicinity, 6–8 Dec 1977.

1388–1417: Puerto Ayacucho and vicinity (with L. Cárdenas de Guevara and M. Pyykkö), 9–10 Jan 1978.

1418–1526: Puerto Ayacucho and vicinity (partly with J. Cerda), 25–30 Jan 1978.

1527–1731: West base of Cerro Yapacana, Santa Bárbara (joint expedition of American Museum of Natural History, New York, and MARNR-CODESUR to Cerro Yapacana), 15–27 Feb 1978.

1733–1750: Puerto Ayacucho and vicinity (with G. Davide), 12–13 Apr 1978.

12 May 1978: Santa Bárbara and mouth of Río Ventuari (with J.A. STEYERMARK, P. Berry and P. Redmond).

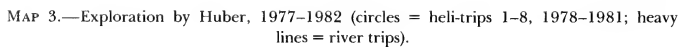
25 May 1978–17 Jul 1982:

Nrs.

1751–2071: Canaripó, west base of Cerro Yapacana, 25 May–4 Jun 1978.

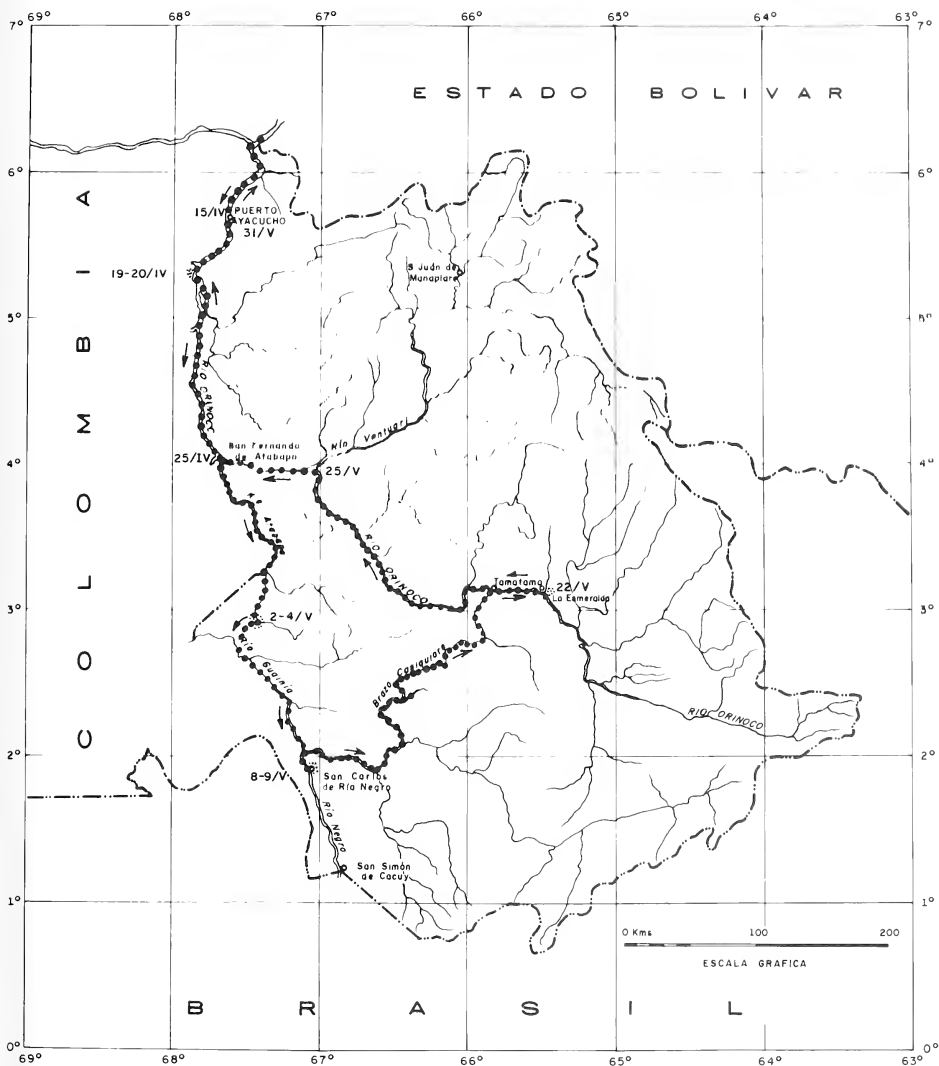
2072–2078: Valley of Río Cataniapo (with A. Catalán), 4 Jul 1978.

2079–2152: Puerto Ayacucho and vicinity, 5–7 Jul 1978.



- 2171–2199: Puerto Ayacucho and vicinity (with A. Zinck), 4–6 Aug 1978.
- 2200–2704: ["Heli-trip 1"] Manapiare Basin, upper Ventuari, lower Ventuari, Río Guayapo, the base of Yapacana, Caño Yagua, Maroa, Pimichín, Yavita, Río Atabapo, 15–26 Aug 1978.
- 2705–2745: Puerto Ayacucho and vicinity, 13–16 Nov 1978.
- 2746–3077: Santa Bárbara, Caño Perro de Agua, west base of Cerro Yapacana, Caño Yagua (with S. Tillett), 30 Nov–12 Dec 1978.
- 3078–3143: Caño Yagua, 15–19 Jan 1979.
- 3144–3145: Puerto Ayacucho and vicinity (with C. Rangel), 16 Feb 1979.
- 3146–3637: ["Heli-trip 2"] Munduapo, San Antonio, Caño Yagua, Cerro Moriche (south base), lower Ventuari, Río Guayapo, Esmeralda, Guarinuma, Caño San Miguel, Maroa, Pimichín, Río Temi, middle Ventuari, Manapiare, Río Asita, upper Ventuari, Cerro Parú, 17 Feb–3 Mar 1979.
- 3638–3775: Caño Caname, west base of Cerro Yapacana, Caño Yagua (with G. Davidge and S. Tillett), 30 Apr–9 May 1979.
- 3776–3817: Puerto Ayacucho and vicinity, 23–24 May 1979.
- 3818–4114: ["Heli-trip 3"] Río Autana, Santa Bárbara, Caño Yagua, southeast and northeast base of Cerro Yapacana, Río Guayapo, lower Ventuari, Caño Caname, 26 Jun–3 Jul 1979.
- 4115–4250: Puerto Ayacucho and vicinity, 17–22 Aug 1979.
- 4269–4649: ["Heli-trip 4"] Cerro Parú, upper Ventuari, Manapiare, Cerro Camani, middle and upper Río Parucito, 3–10 Oct 1979.
- 4650–4773: Puerto Ayacucho and vicinity, 7 Nov–4 Dec 1979.
- 4785–4793: Puerto Ayacucho and vicinity, 21–24 Jan 1980.
- 4794–4795: Puerto Ayacucho and vicinity, 16 Feb 1980.
- 4796–5171: ["Heli-trip 5"] Cerro Yapacana (northwest base), Caño Yagua, lower Ventuari, Pimichín, Caño Caname, middle Río Ocamo, Esmeralda, Río Cunucunuma, Parima, Río Puruname, Río Guayapo, Río Guasacavi, San Antonio, 28 Feb–10 Mar 1980.
- 5172–5192: Puerto Ayacucho and vicinity, 14 Mar 1980.
- 5193–5202: Puerto Ayacucho and vicinity, 11–14 Apr 1980.
- 5204–5250: Puerto Ayacucho and vicinity, 9 May 1980.
- 5251–5265: Puerto Ayacucho and vicinity, 18–21 Jun 1980.
- 5266–5281: Puerto Ayacucho and vicinity, 11 Jul 1980.
- 5282–5597: ["Heli-trip 6"] Lower Río Cuaio, Río Autana, Limón de Parhueña, Caño Yagua, Santa Bárbara, San Antonio, Río Puruname, Río Guayapo, Cerro Yapacana (north base), Río Sipapo, 14–28 Jul 1980 (with S. Tillett).
- 5598–5599: Puerto Ayacucho and vicinity, 29 Jul 1980.
- 5600–5633: Puerto Ayacucho and vicinity, 19–21 Aug 1980.
- 5634–5697: San Carlos de Río Negro and surroundings (IVIC study sites) 15–16 Sep 1980 (with E. Medina and H. Clark).
- 5698–5734: Puerto Ayacucho and surroundings, 23 Sep 1980.
- 5735–5754: Puerto Ayacucho and vicinity, 4–5 Nov 1980 (with P.J.M. Maas).
- 5755–6126: ["Heli-trip 7"] Lower Río Siapa, Río Pacimoni, Cerro Aracamuni, Caño Pimichín, Río Guasacavi, Sierra Parima, middle Río Siapa, Serranía Vinilla, lower Río Yatúa, San Carlos de Río Negro, Serranía Cariche, lower Caño Marueta, 6–18 Feb 1981 (partly with E. Medina).
- 6127: Puerto Ayacucho and vicinity, 25 Mar 1981.
- 6128–6241: ["Heli-trip 8"] Sierra Parima, Cerro Duida (south base), Río Ocamo, Serranía Vinilla, Río Asisa, Río Yagua, Río Sipapo, 12–16 Jun 1981.

- 6242-6246: Puerto Ayacucho and vicinity, 16 Jun 1981 (with A. Braun).
- 6272-6278: Puerto Ayacucho and vicinity, 15 Feb 1982 (with F. Guánchez).
- 6279-6294: Puerto Ayacucho and vicinity, 27 Feb 1982.
- 6353-6435: Guachapana, Río Puruname, Puerto Ayacucho, 26 May-8 Jun 1982 (with S. Tillett).
- 6436-6437: Puerto Ayacucho and vicinity, 17, 23 Mar 1982 (with J. Cerda and P. Piñate).
- 6438-6451: Santa Bárbara, Trapichote, 15-17 Jul 1982 (with M. Balick and F. Guánchez).
- 14 Dec 1982: Puerto Ayacucho and vicinity (with F. GUÁNCHEZ).
- First set of all collections: VEN; dupl. NY, US, U.
- Notes: Responsible for the research project "Inventario botánico-ecológico del bioma sabana en el Territorio Federal Amazonas," (joint project MARNR-CODESUR and CONICIT) during 1977-1981; coordinator of the research project: "Investigaciones ecológicas sobre el límite bosque-sabana en la Cuenca del Río Galipero, T. F. Amazonas" (joint project MARNR-CODESUR, CONICIT, and University of Göttingen (Fed. Rep. of Germany)), during 1979-1981.
- A detailed index of all collecting localities in T. F. Amazonas during 1977-1982 has been deposited at VEN, NY, MO, and US.
- Publications: Huber, 1980, 1982a,b, in press; Fölster and Huber, in press.
- HUMBOLDT, FRIEDRICH HEINRICH ALEXANDER VON (Map 4)
- 1769-1859; Germ.; Naturalist, geographer, botanist, zoologist.
- Travelled in Territorio Federal Amazonas (with A. Bonpland).
- 13 Apr 1800: Entering T. F. Amazonas on Río Orinoco through Raudal de Tabaje, south of confluence of Río Meta with Río Orinoco.
- 14 Apr 1800: Isla Guachaco [or Vachaco], mouth of Río Parueni [Parhueña?], Isla Panumaná.
- 15 Apr 1800: Mouth of Río Anaveni, Atures [San Juan Nepomuceno de los Atures].
- 17 Apr 1800: Mouth of Río Cataniapo, Raudal Garcita, Isla Tomo [Colombia].
- 18 Apr 1800: Mouth of Río Tomo, Raudal de los Guahibos, Puerto de Maipures, San José de Maipures [Colombia].
- 19-20 Apr 1800: Maipures [Colombia].
- 21 Apr 1800: Puerto de Maipures, Raudal de Camejé, Isla Piedra Ratón.
- 22 Apr 1800: Mouth of Río Sipapo, mouth of Río Vichada [Colombia], Caño Piriayavi, mouth of Río Zama [Colombia].
- 23 Apr 1800: Mouth of Río Mataveni, El Castillito, mouth of Río Sincurivapo, Peñón de Aricagua.
- 24 Apr 1800: Mouths of Ríos Ucata, Arapa and Caranaveni, Siquita, Guaviare, San Fernando de Atabapo.
- 25 Apr 1800: San Fernando de Atabapo.
- 26 Apr 1800: Guapasoso.
- 27 Apr 1800: Mouth of Río Ipurichapano, Piedra del Tigre.
- 28 Apr 1800: Piedra and Raudalito de Guarinumá, Mendaxari.
- 29 Apr 1800: San Baltasar.
- 30 Apr 1800: Mouth of Río Atacavi, mouth of Río Guasacavi, Río Temi, Piedra de Astor.
- 1 May 1800: Confluence of Río Temi and Río Tuamini, San Antonio de Javita [Yavita].
- 2-4 May 1800: Javita.
- 5 May 1800: Javita, Puerto de Pimichin.
- 6 May 1800: Caño Pimichin, Río Negro [= Río Guainia], Maroa, mouth of Río Aquio, mouth of Río Tomo, San Miguel de Davipe, Río Conorichite or Itinivini [= Caño San Miguel], Isla Dapa.
- 7 May 1800: Mouth of Casiquiare, San Carlos de Río Negro.
- 8-9 May 1800: San Carlos de Río Negro.
- 10 May 1800: Río Negro, Isla Zaruma and Mini, Raudales de la Piedra de Uinumané, mouth of Casiquiare, Isla de Garigave, San Francisco Solano.
- 11 May 1800: Caño Daquiapo, Caño Guachap-



MAP 4.—Exploration by Humboldt and Bonpland, 1800 (number/roman numeral = day/month).

uru, Raudales de Cunanivicari, Piedras Guanari, Piedra Culimacari.

12 May 1800: Mouth of Río Pacimoni, Misión de Mandavaca [Quirabuena].

13 May 1800: Mouth of Río Idapa [Siapa], Raudal del Cunuri.

14 May 1800: Caño Caterico, Misión de Vasiva, Laguna Vasiva.

15–20 May 1800: Río Casiquiare.

21 May 1800: Entering Río Orinoco, Caño Tamatama, Esmeralda.

22 May 1800: Esmeralda, mouth of Río Guapo [= Iguapo].

23 May 1800: Esmeralda, bifurcation of Río Orinoco, Playa del Casiquiare.

24–25 May 1800: Río Orinoco, mouth of Río Cunucunuma, mouth of Río Guanami, mouth of Río Puruname, mouth of Río Jao [Yagua], Santa Bárbara.

26 May 1800: Santa Bárbara, Isla de Minisi [Inicio].

27 May 1800: Mouths of Ríos Quejanuma, Ubua and Masao, San Fernando de Atabapo.

28 May 1800: San Fernando de Atabapo, El Castillito, mouth of Río Metaveni [Colombia].

29 May 1800: Mouth of Mataveni, Raudal de Maipures.

30 May 1800: Misión de Maipures [Colombia].

31 May 1800: Rápidos de los Guahibos, Raudal Garcita, Puerto de la Expedición, Caverna de Atarupe, Misión de Atures.

1 Jun 1800: Raudalito de Canucari, Isla Panumaná.

2 Jun 1800: Playa de Guachaco, Misión San Borja, mouth of Río Meta, Carichana [Edo. Bolívar].

Notes: Presumably, Humboldt and Bonpland collected approximately 500 numbers of plants during their travel in T. F. Amazonas. The first set is deposited at P; dupl. at B, KIEL, HAL, L, LINN, MEDEL, PC, W.

Publications: Humboldt, 1816–1831; 1818–

1829; Sandwith, 1925; Dugand, 1956; Stearn, 1968.

Instituto Nacional de Parques (INPARQUES)

Autonomous governmental institution annexed to the Ministerio del Ambiente y de los Recursos Naturales Renovables (MARNR), with the function of management and protection of the national parks throughout Venezuela.

Since January 1981, the Instituto Botánico, including the Herbario Nacional de Venezuela (VEN), has been placed under INPARQUES in the Dirección de Investigaciones Biológicas.

Personnel of the Instituto Botánico, INPARQUES, who have made botanical collections in Territorio Federal Amazonas: Francisco Delascio C., Beatriz Garófalo, Mario Guariglia, Luisa Elena Guinand, Gilberto Morillo, Julian A. Steyermark.

National Parks and Natural Monuments in T. F. Amazonas:

Parque Nacional "Yapacana," Departamento Atabapo, 320,000 ha.

Parque Nacional "Duida-Marahuaca," Departamento Atabapo, approximately 210,000 ha.

Parque Nacional "Serranía La Neblina," Departamento Río Negro, approximately 1,360,000 ha.

Monumento Natural "Piedra El Cocuy," Departamento Río Negro.

Monumento Natural "Cerro Autana," Departamento Atures.

Instituto Venezolano de Investigaciones Científicas (IVIC)

1974–1982: Long-term ecological research on the composition and functioning of Amazon forest ecosystems ("Tierra firme" forests, "Caatinga" forests, "bana" scrub) in the vicinity of San Carlos de Río Negro, along road to Solano.

Interinstitutional and multidisciplinary research as part of UNESCO-Man and

Biosphere (MAB) Program on Tropical Forests.

Directors: Dr. Ernesto Medina, Dr. Rafael Herrera (IVIC).

Institutions involved:

IVIC (Caracas, Venezuela).

Consejo Nacional de Investigaciones Científicas y Tecnológicas, CONICIT (Caracas, Venezuela).

University of Georgia, Institute of Ecology (Athens, Georgia, U.S.A.).

National Science Foundation, NSF (Washington, D.C., U.S.A.).

Max-Planck-Institut, Abt. f. Tropenökologie (Plön, Fed. Rep. of Germany).

Deutsche Forschungsgemeinschaft, DFG (Fed. Rep. of Germany).

Scientists involved with plant collecting at the IVIC study sites near San Carlos de Río Negro: Eberhard F. Brünig, Robert Buschbacher, Howard L. Clark, Nelda Dezzzo, Kathleen Ennis Clark, Jerry Hall, Hans Klinge, Ernesto Medina, Christopher Uhl.

Ishikawa, Motosuke

19?–; Japan.; Ethnobotanist.

22–29 Sept 1973: Puerto Ayacucho and surroundings (with G. MORILLO).

Iturriaga C., Teresa María

1955–; Venez.; Biology study (UCV, Fac. de Ciencias, Caracas).

Apr 1978–Mar 1979: Puerto Ayacucho and vicinity (Paria Grande) (with M. GUARIGLIA, fungi; with B. GARÓFALO and M. Guariglia).

Publication: Guariglia and Iturriaga, 1980.

Jaffée, Werner

1914–; Venez.; Biochemist (UCV, Fac. de Ciencias, Caracas).

5–21 Aug 1964: Puerto Ayacucho, Río Atabapo, Río Orinoco, Río Cunucunuma, Río Ocamo (with V. VARESCHI).

JAHN, ALFREDO

1867–1940; Venez.; Naturalist, geologist.

Oct 1887: Upper Río Orinoco, Atures, San

Fernando de Atabapo (trip interrupted at San Fernando de Atabapo due to illness).

Notes: According to Arnal (1943), Jahn made his first plant collections on this expedition, which was conducted by the Venezuelan ethnologist and agronomist Vicente Marciano. His collections were studied by Adolfo Ernst and the results published in a short paper (Ernst, 1888). Jahn was actually the first Venezuelan naturalist collecting plants in T. F. Amazonas.

Publications: Ernst, 1888; Jahn, 1909a,b.

JANGOUX, JACQUES IVAN G.

1938–; Belg.; Anthropologist, photographer, botanist.

Aug? 1973: Mountains around Caño Iguana [right affluent of Río Asita, upper Ventuari basin], 1800 m.

Few nrs.; MYF.

Notes: Collected *Arthrostyidium schomburgkii* (Bennett) Munro during this trip, which was primarily devoted to the study of the life of Hoti Indians.

9–23 Apr 1974: San Juan de Manapiare, Cerro Calentura [= Cerro Ualípano, headwaters of Río Parucito; by helicopter], Hato Yaví [lower Río Parucito], Caño Majagua [left affluent of lower Río Parucito].

Nrs. 10,001–10,159?; VEN, NY?.

Notes: Aim of the expedition: nature photography documented by botanical voucher specimens.

Jiménez, Hernan

195?–; Venez.; Pharmacy student (UCV, Fac. de Farmacia, Caracas).

19–23 Jul 1977: Puerto Ayacucho and vicinity; Isla Ratón (with S. TILLET and O. Huber).

Jordan

This name cited by Prance (1972, *Flora Neotropica*, volume 9, page 127) as collector of *Licania hypoleuca* var. *hypoleuca* ["AMAZONAS: Jordan s.n., VEN—Nr. 87,090"] refers actually to a collection of Foldats, s.n.[?], from Santa Cruz, Río Atabapo, Sep 1960.

Keith, William M., Jr.

1934- ; U.S.; Botany student (New York Botanical Garden).

11 Sep-15 Oct 1957: Upper Río Orinoco, Río Atabapo, Río Guainía, Río Casiquiare, Río Pacimoni (with B. MAGUIRE, J.J. Wurdack, and C.K. Maguire).

King, Martin M.

19??- ; U.S.;

20 Jun 1977: San Juan de Manapiare, Yutajé (with J.A. STEYERMARK and P. Redmond).

Klinge, Hans

19??- ; Germ.; Plant ecologist (Max-Planck-Institut für Limnologie, Abt. Tropenökologie, Plön, Fed. Rep. of Germany).

1974-1981: San Carlos de Río Negro and surroundings; IVIC study sites.

Occasional collections with E. MEDINA; VEN.

LASI, MARGIE

1959- ; Venez.; Limnologist (Univ. "Simón Bolívar," Caracas).

26 Oct 1982: Río Autana.

Nrs. 001-006; VEN.

LASSER, TOBIAS

1911- ; Venez.; Botanist (Instituto Botánico, Caracas).

Dec 1958: Upper Ventuari (with Dryer).

1 specimen at VEN (*Dicranopygium bolivariense* Harl., Lasser & Dryer 4311, 19 Dec 1958) [doubtful locality].

LEOPOLD III, KING OF BELGIUM

1901-1983; Belg.; Explorer.

10 May-9 Jun 1952: Expedition to upper Orinoco, Río Negro, and Río Autana [Expedition "Elata"].

Itinerary:

10-11 May 1952: Caracas to Puerto Ayacucho to Esmeralda [by airplane].

12 May 1952: Esmeralda.

13-14 May 1952: Esmeralda to Platanal.

15 May 1952: Platanal to Majekodo, and return to Platanal.

16 May 1952: Platanal, Esmeralda, mouth of Río Cunucunuma.

17 May 1952: Río Cunucunuma, Jakaré [Raudal Picure].

18 May 1952: Jakaré, mouth of Río Cunucunuma.

19 May 1952: Mouth of Río Cunucunuma to mouth of Río Casiquiare.

20 May 1952: Mouth of Casiquiare, Capibara.

21-22 May 1952: Capibara, San Carlos de Río Negro.

22 May 1952: San Carlos de Río Negro, San Felipe [Colombia], Santa Rosa de Amanadona.

23-25 May 1952: Santa Rosa de Amanadona, El Carmen, Piedra del Cucuy [ascent], San Carlos de Río Negro.

25-28 May 1952: San Carlos de Río Negro.

29 May 1952: San Carlos de Río Negro, Río Guainía.

30 May-1 Jun 1952: Río Guainía, Caño Pimichín, Yavita.

2 Jun 1952: Yavita, San Fernando de Atabapo, Amanaven, El Castillito [Río Orinoco].

3-4 Jun 1952: El Castillito, Isla Ratón, Río Autana.

5 Jun 1952: Río Autana, Raudal Perezeta.

6 Jun 1952: Caño Umaj-Aje (affluent of Río Autana).

7 Jun 1952: Río Autana, lower Río Cuao.

8-9 Jun 1952: Río Autana, Puerto Ayacucho. Nrs. coll.?: BR?

Publication: Anonymous, s.d. [1956?] [photograph no. 68 showing botanical collecting along Río Autana].

LEVEL YANABE, JOSÉ SILVERIO

1929- ; Venez.; Expedition guide.

19 Apr-12 Sep 1954: Upper Orinoco, region of San Fernando de Atabapo.

155 nrs.; NY, VEN.

Notes: Resident of San Fernando de Atabapo and, recently, Puerto Ayacucho; guide on most of B. Maguire's expeditions in T. F. Amazonas; has made occasional botanical collections for B. Maguire (NY). Some of the numbers are preceded by "L-."

LICHY, EVELINE

19??- ; French; ?

- Aug–Sep 1937: Yavita.
Approximately 25–30 nrs.; VEN, P?
- LIESNER, RONALD
1944–; U.S.; Botanist (Missouri Botanical Garden, St. Louis).
10 Nov–5 Dec 1977: San Carlos de Río Negro and surroundings, IVIC study sites (partly with H. Clark).
Nrs. 3275–4200.
3 Apr–12 May 1979: San Carlos de Río Negro and surroundings (IVIC study sites).
Nrs. 6066–7397.
20 Jan–5 Feb 1980: San Carlos de Río Negro and surroundings (partly with H. Clark).
Nrs. 8462–9143.
15–17 Feb 1981: Ocamo, Esmeralda, Cerro Marahuaca, Cerro Duida, Cerro Sipapo, Puerto Ayacucho (with J.A. STEYERMARK and C. Brewer-Carias).
26 Mar 1981: Yutajé (with P. Redmann [wrongly cited on labels for Redmond] and C. Clift).
Nrs. 10,955–10,995.
All collections VEN, MO; dupl. at NY.
Publication: Clark and Liesner, in prep.
- LISTER, JOHN R.A.
1954–; Brit.; Ethnobotanist.
Sep 1975–Aug 1976: Río Ventuari upstream from Las Carmelitas, middle and upper Río Ventuari basin, Río Manapiare basin (with M.E.M. Colchester).
Nrs. 1–750 approximately, Lister & Colchester.
Nrs. 2001–2700 approximately, Colchester & Lister.
MYF, K, VEN, St. Bartholomew's Medical College, London.
Notes: "Proyecto Ventuari," supported by CO-DESUR and UCV. Ethnobotanical research on Guahibo, Hohontu, Hoti, Makiritari, Piaroa, Sanemá, and Yavarani Indians.
Publication: Colchester and Lister, ms.
- LIZOT, JACQUES
1938–; French; Ethnologist, anthropologist.
1969–present: Upper Orinoco, region of Ocamo, Mavaca, Platanal (Mahekodoteri), Río Manaviche.
Approximately 200? nrs.; VEN, P?
Jan 1970: Mavaca (with L. ARISTEGUIETA).
Notes: Mainly cultivated plants and useful wild plants of Yanomami Indians. In some cases, a compound numbering system is used: e.g., 1972-18, or 1975-41, indicating in the first term the year of collection.
Publications: Lizot, 1972, 1978, 1980.
- López, Francisco
1923?–1949?; Colomb.; Expedition guide, field assistant.
Dec 1947: San Carlos de Río Negro, mouth of Caño Casiquiare, Piedra Cocuy (with R.E. SCHULTES).
- LUETZELBURG, PHILIPP VON
1880–1948; Germ.; Botanist, explorer.
5–9 Oct 1928: Río Cassiquiare [Brazilian spelling for Casiquiare] (Laja de Caraça, Buenos Ayres), Esmeralda.
Nrs. ?; M, R. NY, F.
Notes: According to Prance (1971), Luetzelburg was a mainly Brazilian collector with the "Comissão Rondon, Inspeção de Fronteiras do Brasil." According to Pittier et al. (1945–1947), Luetzelburg collected several new palm species on this trip, described by Burret in 1930; the collection numbers cited in Pittier for these palms range between 22,297 (from Esmeralda) and 23,150 (from Solano); accordingly, Luetzelburg would have collected more than 850 nrs. on a short trip into Venezuela of only 5 days, which appears somewhat improbable. Evidently, Luetzelburg's numerical sequence is irregular and does not conform to his itinerary nor sequence of dates in Venezuela.
- Luteyn, James
1948–; U.S.; Botanist (New York Botanical Garden).
27 Jan–11 Feb 1982: Culebra, Río Cunucunuma, Cerro Marahuaca, Cerro Duida, Cerro Huachamacari (with J.A. STEYERMARK, M. Guariglia, N. Holmgren, and S.

(Mori).

Notes: Specialist in neotropical Ericaceae.

MAAS, PAUL JOHANNES MARIA

1939- ; Dutch; Botanist (Univ. of Utrecht, Inst. of Systematic Botany).

3-6 Nov 1980: Puerto Ayacucho and vicinity (with O. Huber and F. Guánchez).

Nrs. 5079-5164; VEN, U.

8 Nov 1980: Salto Yutajé (with P. Redmond, J.A. Steyermark and A. Field).

Nrs. 5165-5180; VEN, U.

Notes: Specialist in neotropical Burmanniaceae, Gentianaceae, Zingiberaceae, and Cannaceae.

MÄGDEFRAU, KARL

1907- ; Germ.; Botanist (Univ. of Tübingen, Fed. Rep. Germany).

6 Jan-14 Feb 1958: Upper Orinoco, Esmeralda, Río Ocamo, Casiquiare, Río Negro, Río Guainía, Caño Pimichín, Yavita, Río Atabapo, Río Orinoco (phanerograms with V. VARESCHI).

Nrs. 113-298; M, VEN, private herbarium K. Mägdefrau.

Notes: Member of the "Humboldt-Gedächtnis-Expedition" [Humboldt Memorial Expedition]; own collections refer mainly to cryptograms (mosses, hepatics, and lichens).

Publications: Mägdefrau 1958, 1960, 1963, 1973; Vareschi, 1959; Mägdefrau and Wutz 1961, 1962.

MAGUIRE, BASSETT (Map 5)

1904- ; U.S.; Botanist (New York Botanical Garden).

15 Nov 1948-15 Mar 1949: Río Cuao, Cerro Sipapo (Paraque) (with L. Politi).

Nrs. 27,305-29,039.

18 Apr-21 May 1949: Cerro Duida, Cerro Marahuaca [lower slopes] (with B. Maguire, Jr.).

Nrs. 29,040-29,221.

17-26 Oct 1950: Río Atabapo.

Nrs. 29,222-29,345.

2 Nov 1950-21 Jan 1951: Cerro Duida, Cerro Huachamacari, Cerro Yapacana, Cerro

Moriche (with R.S. Cowan and J.J. Wurdack).

Nrs. 29,346-31,351.

23 Jan-5 Feb 1951: Cerro Guanay (with K.D. Phelps, C.B. Hitchcock, G. Budowski, and W.H. Phelps, Jr.).

Nrs. 31,600-31,789.

12-17 Feb 1951: Cerro Camani (with K. D. Phelps, C.B. Hitchcock, G. Budowski, and W.H. Phelps, Jr.).

Nrs. 31,790-831.

4 Mar 1951: Puerto Ayacucho and vicinity.

Nrs. 31,832-31,836.

27 Jan-9 Mar 1953: Cerro Yutajé (with C. Maguire).

Nrs. 35,000-35,539.

15 Mar-24 Apr 1953: Upper Río Orinoco, Río Casiquiare, Río Negro down to Piedra Cocui, Río Guainia (with J.J. Wurdack and C. Maguire).

Nrs. 34,478-34,999, 35,540-35,736.

7 Nov 1953-18 Feb 1954: Río Orinoco, Río Atabapo, Río Casiquiare, Río Guainía, Río Pacimoni, Río Yatua, Cerro Neblina (with J.J. Wurdack and G.S. Bunting).

Nrs. 36,031-37,714.

11 Sep-16 Oct 1957: Upper Río Orinoco, Río Atabapo, Río Guainía, Río Casiquiare, Río Pacimoni (with J.J. Wurdack, C. Maguire, and W.M. Keith, Jr.).

Nrs. 41,428-41,923.

17 Oct 1957-14 Jan 1958: Río Pacimoni, Río Yatúa, Cerro de la Neblina, upper Río Orinoco (with J.J. Wurdack and C. Maguire).

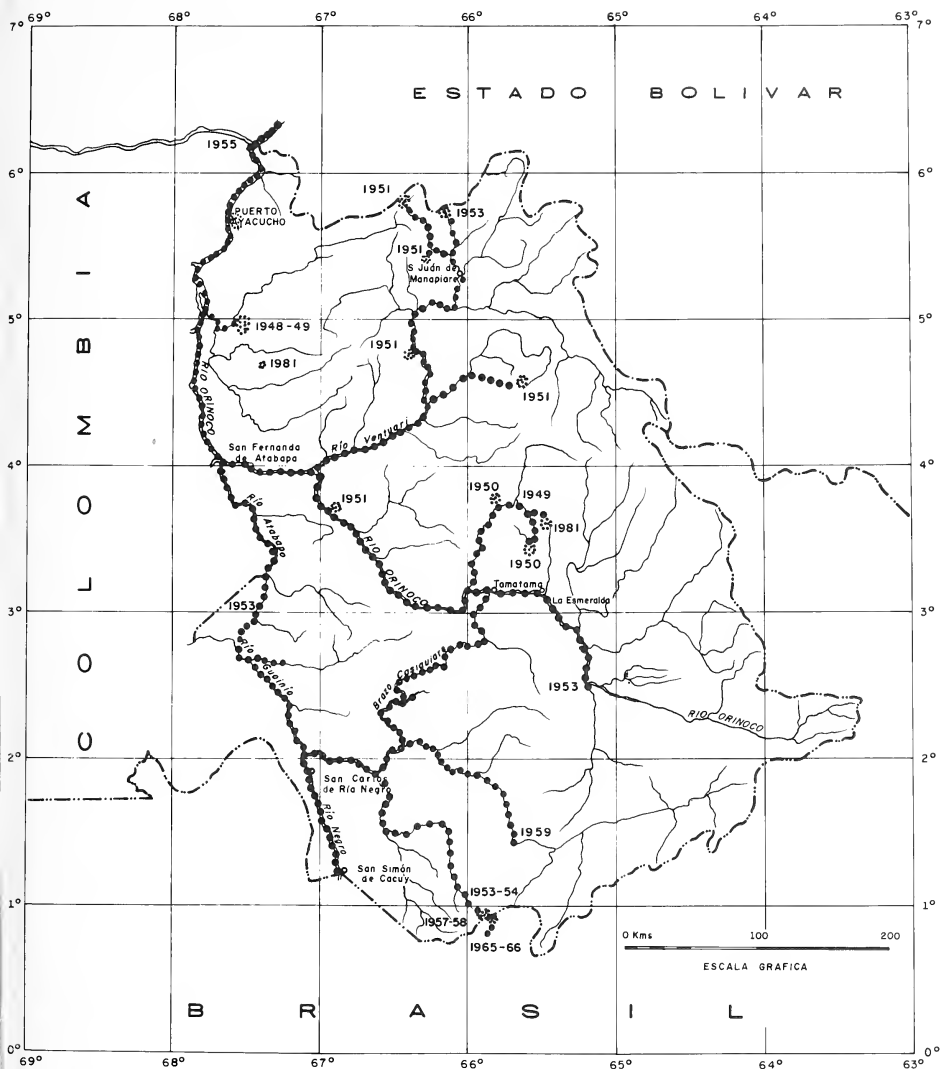
Nrs. 41,924-42,655.

28 Oct 1965-7 Feb 1966: Cerro de la Neblina, Venezuelan-Brazilian frontier (with J. Murça Pires, J.A. Steyermark, C. Maguire, N.T. da Silva, and U. Brazão).

Nrs. 60,052-61,001.

15 Jan 1981: Cerro Marahuaca [summit], Cerro Sipapo (with J.A. Steyermark, C. Maguire, and C. Brewer-Carías).

Nrs. 65,563-65,701, 65,711-65,712 [Cerro Marahuaca]. 65,702-65,710 [Cerro Sipapo].



MAP 5.—Exploration by Maguire and colleagues (New York Botanical Garden), 1948-1981
(clustered dots = intensive collecting).

All collections: NY, VEN; dupl. at US, MO, F, U, K, BM and others.

Notes: Head of the largest botanical collecting program in T. F. Amazonas ("New York Botanical Garden's Exploration Program of the Flora of the Guayana Highland"), during which approximately 11,800 nrs. were collected from this region. The dates cited here for each expedition were furnished by B. Maguire in 1982 and differ slightly in some cases from those given in Maguire, 1954. More extensive data will be published later by Maguire.

Publications: Anonymous, 1949; Lasser and Maguire, 1950; Maguire and Deery de Phelps, 1951; Maguire and collaborators, 1953, 1957, 1958, 1960, 1961, 1964, 1965, 1967, 1969, 1972, 1978, 1981; Maguire, 1955, 1964a,b, 1970, 1979; Maguire and Wurdack, 1959, 1960.

Maguire, Bassett, Jr.

192?- ; U.S.; Biologist.

18 Apr-21 May 1949: Cerro Duida and Cerro Marahuaca (with B. MAGUIRE).

Maguire, Celia K.

1919- ; U.S.; B. Maguire's wife (New York Botanical Garden).

27 Jan-9 Mar 1953: Cerro Yutajé (with B. MAGUIRE).

15 Mar-24 Apr 1953: Upper Río Orinoco, Río Casiquiare, Río Negro down to Piedra Cocui, and Río Guainía (with B. MAGUIRE and J.J. Wurdack).

11 Sep-16 Oct 1957: Upper Río Orinoco, Río Atabapo, Río Guainía, Río Casiquiare, Río Pacimoni (with B. MAGUIRE, J.J. Wurdack, and W.M. Keith, Jr.).

17 Oct 1957-14 Jan 1958: Río Pacimoni, Río Yatúa, Cerro de la Neblina and upper Río Orinoco (with B. MAGUIRE and J.J. Wurdack).

15 Jan 1981: Cerro Marahuaca [summit], Cerro Sipapo (with B. MAGUIRE, J.A. Steyermark, and C. Brewer-Carías).

MANARA, BRUNO

1939- ; Venez.; Botanical artist (Instituto Botánico, Caracas).

25-27 Mar 1971: San Carlos de Río Negro and vicinity, road to Solano.

From about nrs. 140-200; VEN.

MARCANO-BERTI, LUIS

1940- ; Venez.; Forestry botanist (ULA, Fac. de Ciencias Forestales, Mérida).

7-9 Dec 1976: Puerto Ayacucho, Samariapo, Isla Ratón.

Nrs. 1-12/76-28-12/76; MER, VEN.

11-17 Mar 1979: San Carlos de Río Negro-Solano (with P. Salcedo).

Nrs.

36-60/979: San Carlos and vicinity (11 Mar 1979).

61-76/979: Road San Carlos-Solano (12 Mar).

77-96/979: Road San Carlos-Solano (13 Mar).

97-109/979: Road San Carlos-Solano (14 Mar).

110-133/979: San Carlos and vicinity (15 Mar).

134-145/979: San Carlos and vicinity (bana scrub) (16 Mar).

146-149/979: San Carlos and vicinity (forest) (16 Mar).

150/979: San Felipe [Colombia] (16 Mar).

MER.

Notes: Specialist in Venezuelan Vochysiaceae; Marcano-Berti uses a compound numbering system referring to the date (month and/or year) of collection.

MATOS, FELIPE

1933- ; Venez.; Botanist (Sociedad de Ciencias Naturales La Salle, Caracas).

27 Mar-7 Apr 1958: San Juan de Manapiare and vicinity, Cerro Morrocay (with Hno. Antonio).

168 nrs.; La Salle, Caracas, U.S.

Notes: "Expedición de la Sociedad de Ciencias Naturales La Salle al Territorio Amazonas."

Publication: Jam Lander, 1958.

MEDINA, ERNESTO

1938- ; Venez.; Plant ecophysiological (UCV, Fac. de Ciencias, Caracas; since 1970 IVIC-Centro de Ecología, Caracas).

16 Apr–6 May 1968: Río Negro, Brazo Casiquiare, Esmeralda, Río Orinoco, Santa Bárbara, San Fernando de Atabapo, Isla Ratón, Puerto Ayacucho.

Nrs. 247–512; VEN.

Notes: Member of the “Geographical Magazine Amazonas Expedition by Hovercraft.”

Publication: Medina, 1971.

22 Jan–25 Feb 1969: Esmeralda, Cerro Duida, Brazo Casiquiare (with M. FARIÑAS and J. Velásquez).

Notes: Leader of the “Expedición Científica AsoVAC al Alto Orinoco.”

Publication: Medina, 1969.

Feb 1971: Río Atabapo, from San Fernando up to Guarinuma.

Approximately 50? nrs.; VEN.

Sep 1973–1982: San Carlos de Río Negro and vicinity (IVIC study sites; some collections with H. Klinge).

? nrs.; VEN [approximately 100–200 nrs.?].

6–11 Feb 1981: Río Siapa, Río Pacimoni, Cerro Aracamuni, Caño Pimichín (with O. HUBER).

Notes: The botanical collections of E. Medina after 1971 do not have numbers (only s/n = sin número), his field notebooks having been lost during a shipwreck in Lake Maracaibo.

Publications: Referring to his collecting activities in San Carlos de Río Negro: Klinge et al., 1977; Medina et al., 1977; Herrera et al., 1978; Klinge and Medina, 1979.

Mercado, Leyda

1957–; Venez.; Agronomist (MARNR, Zone 10, Puerto Ayacucho).

12–15 Aug 1982: Río Orinoco, from San Fernando de Atabapo to Tamatama (with F. GUÁNCHEZ).

Ministerio del Ambiente y de los Recursos Naturales Renovables (MARNR) [Ministry of Environment and Renewable Natural Resources]

Created 1 Apr 1977, as one of the main institutions replacing the former Ministerio de Obras Públicas (MOP), with two organi-

zational structures:

Central organization with four General Directions (in Caracas):

Dirección General de Información e Investigación del Ambiente (DGIIA) [to which CODESUR was annexed from 1977–1979].

Dirección General de Planificación y Ordenación del Ambiente (DGPOA).

Dirección General de Infraestructura (DGI).

Dirección General de Administración del Ambiente (DGAA).

Regional organization with 14 regional offices (“Zonas administrativas”). Territorio Federal Amazonas is administered by the “Zona 10” in Puerto Ayacucho.

Personnel of MARNR involved with botanical collecting in T. F. Amazonas (1 Apr 1977–31 Dec 1982): Hector Canales, Américo Catalán, Julio Cerda, Luis Chesney, Francisco Guánchez, Otto Huber, Leyda Mercado, Ramón Molina, Pedro Piñate, Carlos Rangel.

Ministerio de Obras Públicas (MOP) [Ministry of Public Works]

Governmental institution to which the Comisión para el Desarrollo del Sur de Venezuela (CODESUR), q.v., has been attached since its creation 3 Jul 1969.

The Ministerio de Obras Públicas was transformed into three new ministries on 1 Apr 1977:

Ministerio del Ambiente y de los Recursos Naturales Renovables (MARNR), q.v.

Ministerio de Transporte y Comunicaciones (MTC)

Ministerio de Desarrollo Urbano (MINDUR).

Molina Araque, Jorge *see* Araque Molina, Jorge MOLINA, RAMÓN

1957–; Venez.; Forestry technician (MARNR, Zone 10, Puerto Ayacucho).

21 Jul–28 Sep 1981: Forests of Galipero (north of Puerto Ayacucho).

51 irregularly numbered nrs.; MER, VEN, Regional Herbarium of MARNR at Puerto Ayacucho.

- Notes: Voucher specimens of wood collections for studies on physical-mechanical properties.
- Monachino, Joseph Vincent
1911-1962; U.S.; Botanist (New York Botanical Garden).
Dec 1955: Middle Orinoco north of Puerto Ayacucho (with J.J. WURDACK).
Notes: Specialist on Apocynaceae of the New World.
- MONDOLFI, EDGARDO
1918-; Venez.; Zoologist (UCV, Fac. de Ciencias, Caracas).
May 1975: Caño Platanal [Platanal Mission], upper Orinoco.
3 nrs.; VEN.
13-23 Nov 1980: Río Atabapo, Caño Atacavi, Caño Caname (with P. PIÑATE).
- MONOD, JEAN
193?-; French; Ethnographer.
20 Dec 1976-10 Jan 1977: Lower and upper Río Cuao [Pure'ido].
Nrs. 1-103, 165-169; MYF, P.
Notes: Ethnobotanical research with Piaroa Indians. Nrs. 104-164 were not used.
- Morales M., Antonio
1940-; Venez.; Chemist (ULA, Fac. de Farmacia, Mérida).
Jun 1980: Puerto Ayacucho and surroundings, Gavilán (with A. CARABOT).
- Mori, Scott
1941-; U.S.; Botanist (New York Botanical Garden).
27 Jan-11 Feb 1982: Culebra, Río Cunucunuma, Cerro Marahuaca, Cerro Duida, Cerro Huachamacari (with J.A. STEYERMARK, M. Guariglia, N. Holmgren, and J. Luteyn).
Notes: Specialist on neotropical Lecythidaceae.
- MORILLO, GILBERTO
1944-; Venez.; Botanist (Instituto Botánico, Caracas).
5-9 May 1973: Puerto Ayacucho, Laguna Asisa (Cerro Asisa o Parú), San Juan de Manapiare (with Jesús Hoyos).
Nrs. 3156-3195; VEN.
- 22-29 Sep 1973: Puerto Ayacucho, Sanariapo, mouth of Río Cuao, Río Sipapo near mouth of Río Cuao, mouth of Río Guayapo, 14-16 km above mouth of Río Guayapo, 2-3 km up Río Cuao, Isla Ratón, Puerto Ayacucho, Cerro Zamuro and Cerro Coromoto 35 km southeast of Puerto Ayacucho, Raudal de Atures, mouth of Río Cataniapo (with M. Ishikawa).
Nrs. 3406-3663; VEN.
- 23-30 Apr 1974: San Carlos de Río Negro and vicinity, road to Solano, Río Casiquiare between Chapazón and Guirape west of Solano; between Isla Paleta and Caño of the "división" west and south of Santa Lucía [near the Colombia-Venezuela-Brazil frontier], vicinity of San Simón de Cocuy, Puerto Ayacucho (with B. de Morillo and C. Wood).
Nrs. 3884-4224; VEN.
- 1-9 Feb 1977: San Carlos de Río Negro and vicinity, road to Solano, Río Guainía from Raudal del Lombriz to Brazo Casiquiare, Isla Chamanare on Río Casiquiare (some collections with N. Villa and with M. Hassegawa).
Nrs. 4987-5585; VEN.
- 16-26 Nov 1977: Puerto Ayacucho and surroundings (Gavilán, Caño Carinagua), Puerto Venado [south of Samariapo]; Río Sipapo (Márida, Laja Terecay, Laja de Tonina, Laja de Garza, Caño Vaca, Pica de levantamiento forestal # 3 to 10 km south of Laja de Garza, Pica de levantamiento forestal # 4 to 6 km north of Laja de Garza, Laja Rana), Río Orinoco between Isla Ratón and Puerto Venado (with A. Trujillo).
Nrs. 6632-7106; VEN.
- Notes: Botanical collections made as part of a Forest Inventory sponsored by MARNR-CODESUR in the "Reserva Forestal del Sipapo" under the direction of A. Catalán.
- Apr 1978: Río Orinoco, San Fernando de Atabapo, Patacame, Santa Bárbara del Orinoco (with N. Suárez and J. Camico).

Approximately 200 ? nrs.; VEN.

Notes: Botanical collections made as part of a study on secondary vegetation in "conucos" and other cultivated areas in T. F. Amazonas, conducted by N. Suárez (CO-DESUR); notebooks of this trip have been lost. G. Morillo is a specialist in Venezuelan Asclepiadaceae and Apocynaceae.

Morillo, Beatriz de

19??- ; Venez.; wife of G. Morillo.

23-30 Apr 1974: San Carlos de Río Negro and vicinity (with G. MORILLO and C. Wood).

Narbaiza, Iñigo

19??- ; Venez.; Photographer (UCV, Fac. de Ciencias, Caracas).

22-26 Feb 1982; Puerto Ayacucho and vicinity (with R. ORTÍZ).

ORTÍZ Q., RAFAEL E.

1957- ; Venez.; Botany student (UCV, Fac. de Ciencias, Caracas).

22-26 Feb 1982: Puerto Ayacucho and vicinity, between Gavilán and Las Pavas (with I. Narbaiza).

Nrs. 16-44; VEN.

PANNIER, FEDERICO

1934- ; Venez.; Botanist, plant ecologist (UCV, Fac. de Ciencias, Caracas).

28 June-22 Jul 1958: Alto Orinoco expedition (with W. Schwabe).

Itinerary:

Nrs.

916-918: Puerto Páez to Puerto Ayacucho, 28 Jun 1958.

919-948: Puerto Ayacucho, Raudales de Atures, mouth of Río Cataniapo, 29 Jun 1958.

949-966: Misión de Coromoto, 1 Jul 1958.

967-976: Río Orinoco, Isla La Paloma, 3 Jul 1958

977-997: Río Orinoco, above Isla Ratón, 4 Jul 1958.

998-1012: San Pedro, 4 Jul 1958.

1013-1037: Ciquita [=Siquita], 5 Jul 1958.

1037a: San Fernando de Atabapo, 6 Jul 1958.

1038-1040: Trapichote, 7 Jul 1958.

1041-1051, 1061: Santa Bárbara, 8 Jul 1958.

1052-1060: Caridad, 9 Jul 1958.

1062-1069: San Antonio, 10 Jul 1958.

1070-1075: Guanami, 10 Jul 1958.

1076-1093: Esmeralda, 13 Jul 1958.

1094-1112: Ocamo (Njewheteri), 14 Jul 1958.

1113-1134: San Fernando de Atabapo, 18 Jul 1958.

1135-1155: Punta Ceiba, 19 Jul 1958.

1156-1165: Puerto Ayacucho, 20-22 Jul 1958.

1166-1175: Misión Coromoto, 22 Jul 1958. VEN.

Notes: Collection of plants for pharmaceutical research at the chemical factory of Dr. Willmar Schwabe in Karlsruhe, Fed. Rep. of Germany.

Dr. Pannier made a film (8 mm) of the expedition. Total duration of the expedition: 20 Jun 1958 (Caicara), 14 Jul 1958 (Ocamo), 28 Jul 1958 (Caicara); total nrs. collected: Nrs. 839-1189.

PARRA RONDÓN, ROMELIA

1949- ; Venez.; Botanist (UCV, Fac. de Agronomía, Maracay).

8-28 Aug 1982: Samariapo, Santa Bárbara, San Carlos de Río Negro, Isla Boulton (Río Guainía).

Nrs. 1-21; MY.

Notes: Botanical excursion to T. F. Amazonas of members of the Botany Department of UCV, Fac. de Agronomía, Maracay (see also T. Ruiz Zapata).

PHELPS, KATHLEEN DEERY DE

1908- ; Venez.; Explorer, artist.

Feb 1946: Cerro Paraque (Sipapo), west slopes and extreme western summit.

Nrs. 1-63; VEN, NY?.

1-3 Mar 1947: Cerro Yaví, 1400-2400 m (with W.H. Phelps, Jr. and C.B. Hitchcock).

Nrs. 1-82 [nr. 82 from Puerto Ayacucho];

NY, VEN.

Jan 1949: Cerro Parú (Asisa) (with W.H. Phelps, Jr., and C.B. Hitchcock).

? nrs; VEN, NY.

23 Jan–5 Feb 1951: Cerro Guanay (with B. MAGUIRE, C.B. Hitchcock, G. Budowski, and W.H. Phelps, Jr.).

12–17 Feb 1951: Cerro Camani (with B. MAGUIRE, C.B. Hitchcock, G. Budowski, and W.H. Phelps, Jr.).

Publications: Hitchcock, 1947, 1948; Lasser and Maguire, 1950; Maguire and Phelps, 1951.

PIÑATE M., PEDRO

1957–; Venez.; Zoological field assistant (MARNR, Zone 10, Puerto Ayacucho).

13–23 Nov 1980: Caño Atacavi, Río Atabapo, Caño Caname (with E. Mondolfi).

Nrs. 1000–1054 [Río Atabapo, Caño Atacavi, 13–19 Nov 1980] + 11 nrs. [s.n.; Caño Caname, 20–22 Nov 1980].

VEN.

7–12 Oct 1982: Caño Cotúa, lower slopes of west side of Cerro Yapacana.

Approximately 35 nrs.; Regional Herbarium of MARNR, Puerto Ayacucho, VEN.

PINTO E., POLIDORO

1926–; Colomb.; Botanist (Herbario Nacional Colombiano, Bogotá).

18 Mar 1971: Raudal de Atures, El Zamuro [vicinity of Puerto Ayacucho] (with C. Sastre).

Nrs. 1350–1392; COL, P.

PLOWMAN, TIMOTHY

1944–; U.S.; Botanist (Field Museum of Natural History, Chicago).

20–23 Feb 1979: Puerto Ayacucho and vicinity.

Nrs. 7686–7764; VEN, F, U, US, NY.

Notes: Specialist on neotropical Erythroxylaceae.

Politi, Louis

1916–1972; U.S.; Horticulturist (New York Botanical Garden).

15 Nov 1948–15 Mar 1949: Río Cuao, Cerro Sipapo (Paraque) (with B. MAGUIRE).

Notes: Collected mainly living plants for The

New York Botanical Garden.

Pulido F., Juan R.

1926–; Venez.; Entomological technician (Ministerio de Sanidad y Asistencia Social, Maracay).

18–29 Mar 1979: Puerto Ayacucho and vicinity (with B. TRUJILLO).

PUTZ, FRANCIS E.

1952–; U.S.; Plant ecologist (Cornell University, Ithaca, U.S.A.).

10 May–20 Aug 1978: San Carlos de Río Negro and vicinity.

Nrs. 1–300; BH, VEN.

Notes: Collected mainly lianas and palms.

Publications: Putz, 1979, in press.

Pyykkö, Maire

19??–; Finl.; Plant anatomist (Univ. of Helsinki, Finland).

5–10 Jan 1978: Puerto Ayacucho and surroundings (with O. HUBER and L. Cárdenas de Guevara).

Rangel U., Carlos

1951–; Venez.; Forester (MARNR-CODE-SUR, Zone 10, Puerto Ayacucho).

16 Feb 1979: Puerto Ayacucho and vicinity (with O. Huber).

Redmond, Parker

19??–; U.S.; Amateur botanist.

28 Dec 1976: Canaripó (with J.A. STEYERMARK).

2 Mar 1977: Canaripó (with J.A. STEYERMARK and G. Heny).

4 May 1977: Puerto Ayacucho, Tobogán de la Selva (with J.A. STEYERMARK and O. Huber).

11 Jun 1977: Puerto Ayacucho, Gavilán (with J.A. STEYERMARK, P. Berry, and O. Huber).

20 Jun 1977: San Juan de Manapiare, Yutajé (with J.A. STEYERMARK and M. King).

30 Apr 1978: Yutajé, Caño Coro-coro (with J.A. STEYERMARK).

12 May 1978: Santa Bárbara, lower Río Ventuari (with J.A. STEYERMARK, O. Huber, and P. Berry).

22 Feb 1979: Yutajé, Caño Coro-coro (with

- J.A. STEYERMARK and M. Griot).
 8 Nov 1980: Yutajé (with J.A. STEYERMARK, P. Maas, and A. Field).
 26 Mar 1981: Yutajé (with R. LIESNER and C. Clift).
 Notes: One-day field trips made in Mr. Redmond's private aircraft.
- Reyes Q., E.A.
 1951–; Venez.; Pharmacy student (UCV, Fac. de Farmacia, Caracas).
 28 Jan–8 Feb 1975: Esmeralda and base of Cerro Duida (with N. FERRIGNI and C.J. Zorrilla).
- Rodriguez, Henry
 1945–; Venez.; Forestry botanist (ULA, Fac. de Ciencias Forestales, Mérida).
 28 Mar–1 Apr 1971: Puerto Ayacucho, San Fernando de Atabapo, Río Atabapo (Caño Masagua, Isla Sapó) (with L. RUIZ-TERÁN).
- ROGERS, GEORGE K.
 1952–; U.S.; Botanist (Univ. of Michigan, Ann Arbor).
 25 Feb–4 Mar 1978: Puerto Ayacucho, Solano, San Carlos de Río Negro, Río Atabapo.
 Nrs. 13–44; MICH, NY, VEN, U.
 Notes: Collected mainly *Henriquezia* and *Platycarpum*.
 1–20 Nov 1979: Puerto Ayacucho, Cerro Yacapana [base and summit], Maroa, Río Temi, Río Atabapo.
 Nrs. 54–102; MICH, NY, VEN, some at U.
 Notes: Collected mainly *Gleasonia*, *Henriquezia*, and *Platycarpum*.
 Publications: Rogers, 1981a, in press.
- Rojas, Aníbal C.
 19?–; Venez.; Chemist (UCV, Fac. de Ciencias, Caracas).
 15–27 Feb 1978: Savannas and forests at west base of Cerro Yacapana (with S. TILLET and O. Huber).
- ROMERO, GUSTAVO
 195?–; Venez.; Ecologist (Ministerio de Agricultura y Cria, Fondo Nacional de Investigaciones Agropecuarias (FONAIAP), Puerto Ayacucho).
 1982: Puerto Ayacucho and surroundings.
 Few nrs. [irregular collections, mainly orchids]; Herbario Regional del MARNR, Puerto Ayacucho.
- Rooden, Jan van
 1942–; Dutch; Botanist (Univ. of Utrecht, Netherlands).
 6–19 Jul 1969: Puerto Ayacucho, Sanariapo, Río Atabapo, Yavita, Pimichín, Maroa, Río Guainía, Caño Casiquiare (with G. S. BUNTING and L.M.A. Akkermans).
- Rucci, Ivana
 195?–; Ital.; Ethnomedicine (visiting scientist).
 22–27 Jul 1982: Platanal (Mahekodotheri) (with S. SALAROLI).
- RUIZ TERÁN, LUIS
 1923–1979; Venez.; Botanist (ULA, Fac. de Ciencias Forestales, Mérida (until 1968), Fac. de Farmacia, Mérida (1969–1979).
 25 Jul–4 Aug 1967: Puerto Ayacucho and vicinity, Isla Ratón.
 Nrs.
 4268–4312: Carinahua [Carinagua], 25 Jul 1969.
 4313–4401: Montaña Fría, 26–28 Jul 1969.
 4402–4429: Isla Ratón, 29 Jul 1969.
 4430–4467: Cerro Piapoco, 200–400 m, 12–13 km south of Puerto Ayacucho, 31 Jul 1969.
 4468–4512: Vicinity of Puerto Ayacucho, 1 Aug 1969.
 4512a–4546: Pozo Azul, 1 Aug 1969.
 4546a–4593: Cataniapo, 4 Aug 1969.
 MER, VEN.
 Notes: Notebooks nrs. 103–109, deposited at MERF.
- 17 Jan–15 Feb 1968: San Carlos de Río Negro, Solano, Piedra Cocuy (with J. Bautista).
 Nrs.
 4968–4981: San Carlos de Río Negro, 17 Jan 1968.
 4982–4999: San Carlos de Río Negro, Plaza, 18 Jan 1968.
 5000–5031: San Carlos de Río Negro to Solano, 19 Jan 1968.
 5032–5050: San Carlos south to Tibaduco, 20 Jan 1968.

- 5051-5072: San Carlos south to Tibaduco, 22 Jan 1968.
 5073-5106: Guarinuma, 22 Jan 1968.
 5107-5116: San Carlos de Río Negro, 23 Jan 1968.
 5117-5118: [San Carlos de Río Negro] [s.l.], 27 Jan 1968.
 5119: Cucui [Brazil], 28 Jan 1968.
 5120-5143: Santa Rosa de Amanadona, 29 Jan 1968.
 5144-5172: Santa Rosa on trail to Caño Janabo, 30 Jan 1968.
 5173-5196: Santa Rosa de Amanadona, 31 Jan 1968.
 5197-5201: Río Negro, right bank near Brazil-Colombia frontier, 1 Feb 1968.
 5202-5211: Base of Piedra Cocuy, 2 Feb 1968.
 5212-5220: Piedra Cocuy trail, 5 Feb 1968.
 5221-5225: Brazil, approximately 500 m from frontier post, 5 Feb 1968.
 5226-5238: Solano, Caño Casiquiare, 8 Feb 1968.
 5239-5253: San Carlos de Río Negro, near airport, 9 Feb 1968.
 5254-5265: San Carlos, south of Caño Tibaduco, 10 Feb 1968.
 5266-5268: San Carlos de Río Negro, 11 Feb 1968.
 5268a-5275: San Carlos, garden at Misión Salesiana, 12 Feb 1968.
 5276-5279: San Carlos de Río Negro, 13 Feb 1968.
 5280-5294b: San Carlos, trail to Marimarí, 14 Feb 1968.
 5295-5303: Isla de Mayabo, about 4 km south of San Carlos de Río Negro, 15 Feb 1968.

MER. VEN.

Notes: Notebooks nrs. 118-124, deposited at MERF.

28 Mar-1 Apr 1971: Puerto Ayacucho, San Fernando de Atabapo, Río Atabapo (with H. Rodriguez).

Nrs.

6002-6004: Puerto Ayacucho to Tobogán de la Selva, 28 Mar 1971.

6005-6034: San Fernando de Atabapo, 30 Mar 1971.

6035-6066: Río Atabapo, Caño Masagua, 31 Mar 1971.

6067-6099: Río Atabapo, between San Fernando and Isla Sapo, 1 Apr 1971.

MER.

Notes: Notebooks at MERF.

RUIZ ZAPATA, THIRZA

1949-; Venez.; Botanist (UCV, Fac. de Agronomía, Maracay).

8-28 Aug 1982: Samariapo, San Pedro, San Fernando de Atabapo, Santa Bárbara del Orinoco, San Antonio, San Carlos de Río Negro, Piedra Cocuy, Isla Boulton.

Nrs. 3845-4040; MY, Herbario Regional del MARNR, Puerto Ayacucho.

Notes: Botanical excursion to T. F. Amazonas of members of the Botany Department of UCV, Fac. de Agronomía, Maracay, conducted by T. Ruiz Zapata. Other members: Dorys Borges, Celia Moreno, Roger Ramírez, Norca Rojas, JUAN HERNÁNDEZ, and ROMELIA PARRA.

RUTKIS, EDGARS

1912-; Venez.; Botanical assistant (UCV, Fac. de Ciencias, Caracas).

26-30 Oct 1970: San Carlos de Río Negro and vicinity.

Nrs.

204-206: Near San Carlos, 26 Oct 1970.

207-212: Near San Carlos de Río Negro, 27 Oct 1970.

214-223: 0-4 km on road to Solano [under construction], 27 Oct 1970.

224-226: Isla Picure, Río Negro 1 km above San Carlos, 28 Oct 1970.

227-234: Scrub savanna below San Carlos, 28 Oct 1970.

235-240: Solano, Río Casiquiare, 30 Oct 1970.

241-244: Road to Solano, 30 Oct 1970.

Notes: nr. 213 was collected in the Gran Sabana region (Estado Bolívar). Nrs. 241 (= *Polycynis vittata*, Orchidaceae) and 243 (= *Gongora atropurpurea*, Orchidaceae) are wrongly indicated on VEN labels as 421

and 423, respectively.
VEN.

SALAROLI, STEFANO

195?–; Ital.; Architect (visiting scientist).
22–27 Jul 1982: Platanal (Mahekodotheri)
(with I. Rucci).
Nrs. 1–39; MYF.

Salcedo, Pedro

1952–; Venez.; Forestry technician (ULA,
Fac. de Ciencias Forestales, Mérida).
11–17 Mar 1979: San Carlos de Río Negro,
Solano (with L. MARCANO-BERTI).

Sastre, Claude

19??–; French; Botanist (Muséum National
d'Histoire Naturelle, Laboratoire de Phanérogamie, Paris).

18 Mar 1971: Puerto Ayacucho and vicinity
(with P. PINTO).

Notes: Specialist on South American Ochnaceae.

Schmidt, Hermann

18??–19??; Germ.? or Braz.?
1907–1908: Upper Río Negro [Brazil only?]
(with L. WEISS).

Notes: Possibly the same person who accompanied Koch-Grünberg on his expedition from Roraima to the Orinoco, 1911–1913.

SCHOMBURGK, ROBERT HERMANN (Map 6).

1804–1865; Germ.; Explorer, naturalist.
Itinerary in T. F. Amazonas:

31 Jan 1839: Entered Venezuela, coming from the upper Río Uraricoera [Brazil] by crossing the Uraricoera-Orinoco watershed at the headwaters of Río Matakuni in the Warima [= Parima] mountains.
5 Feb 1839: Crossed mountain savannas [= Simarawochi?] in west-southwest direction in the Warima mountains.

8 Feb 1839: Kikiritza mountain (watershed between upper Río Ventuari and Cundama [= Cuntinamo]).

11 Feb 1839: Entered Río Parámu [= Padamo].

15 Feb 1839: Followed the south course of Río Parámu.

21 Feb 1839: 9 A.M. entered Río Orinoco via Río Matakuni.

22–24 Feb 1839: Rest at Esmeralda.

25 Feb 1839: Afternoon, left Esmeralda, entered Casiquiare.

26–28 Feb 1839: Casiquiare.

1 Mar 1839: Lake Vasiva.

2 Mar 1839: Passed mouth of Río Siapa.

3 Mar 1839: Passed mouth of Río Pacimoni, Piedra Vanari [= Guanari], Solano.

4 Mar 1839: Junction of Casiquiare and Río Guainía, San Carlos de Río Negro.

7 Mar 1839: Passed Piedra Cocuy into Brazil. Schomburgk's collections are widely distributed in Europe: BM, G, K, OXF, P.

Publications: Schomburgk, 1840a,b, 1841, 1931; Bentley, 1841; Prance, 1971.

SCHULTES, RICHARD EVANS

1915–; U.S.; Botanist (Harvard University, Cambridge, Mass.).

Dec 1947: San Carlos de Río Negro and vicinity, Piedra Cocuy (with F. López).

Nrs. 9256–9293: San Carlos de Río Negro and vicinity, 9 Dec 1947 (some labels at VEN bear the date 15 Dec 1947).

Nrs. 9380–9400a: At mouth of Río Casiquiare into Río Negro, 17 Dec 1947.

Nrs. 9417–9466: Cerro de Cocuy [Piedra Cocuy], 22–23 Dec 1947.

All collections at GH, US, K, few at VEN.

Notes: Collected widely in adjoining Colombian Amazonia (Vaupés, Guainía, etc.) specializing on rubber trees (*Hevea*).

SCHWABE, WILLMAR

19??–; Germ.; Pharmacist (Karlsruhe, Fed. Rep. of Germany).

28 Jun–22 Jul 1958: Puerto Ayacucho, San Fernando de Atabapo, Santa Bárbara, San Antonio, Esmeralda, Ocamo, Puerto Ayacucho, (with F. PANNIER).

25–28 Dec 1964: Puerto Ayacucho and vicinity, up to Isla Ratón.

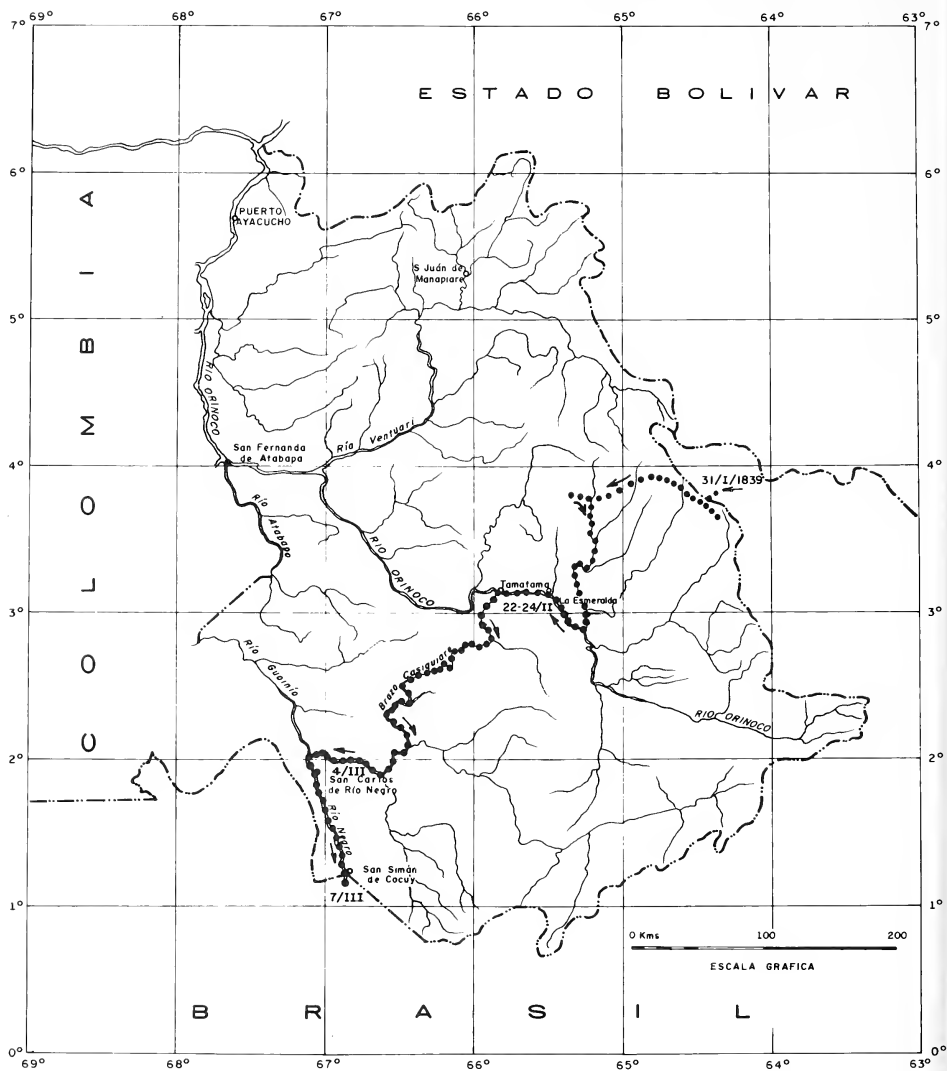
Few nrs. [s.n.]; VEN.

Notes: Dates not confirmed.

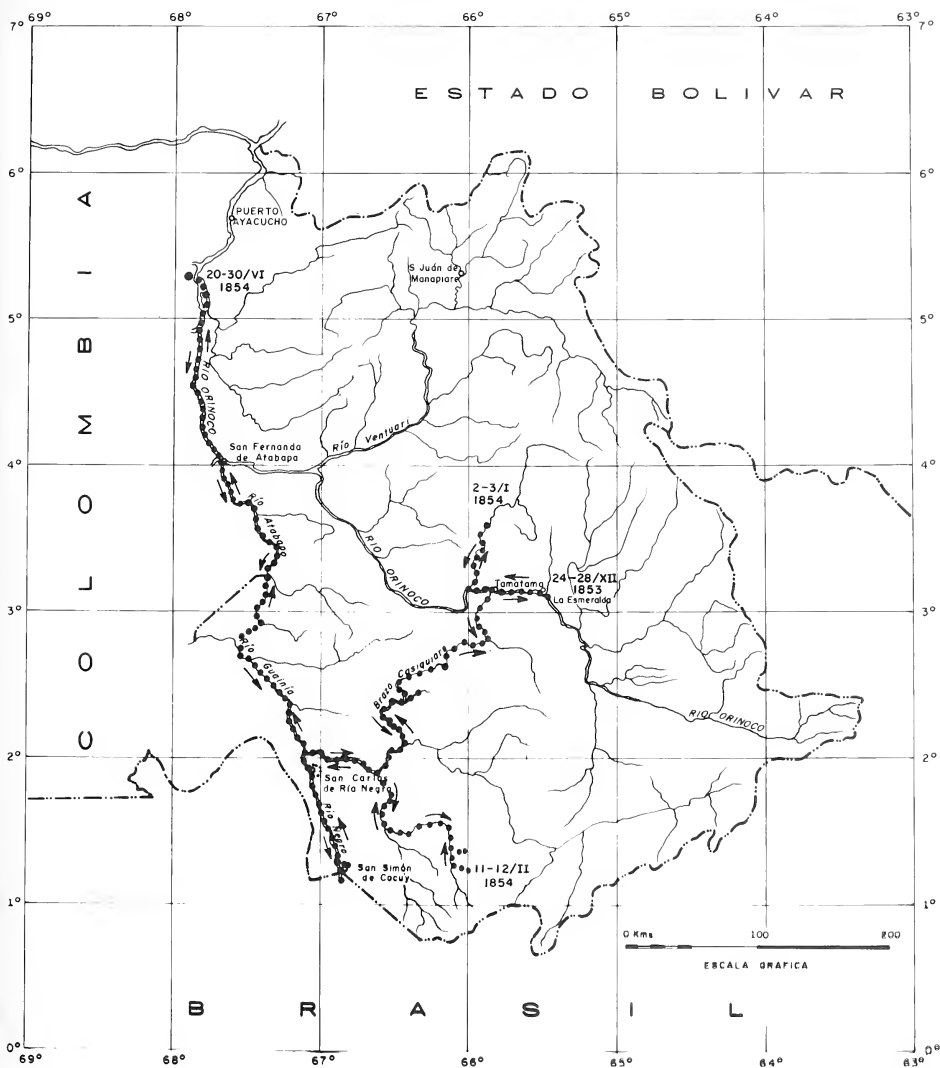
SPRUCE, RICHARD (Map 7)

1817–1893; Brit.; Botanist.

1853–1854: Botanical explorations in Vene-



MAP 6.—Exploration by Schomburgk, 1839 (number/roman numeral = day/month).



MAP 7.—Exploration by Spruce, 1853-1854 (number/roman numeral = day/month).

zuela (T. F. Amazonas).

Itinerary:

1 Apr 1853: Left Marabitanas [Brazil] for San Carlos.

3 Apr 1853: Reached the Brazil-Venezuela frontier.

11 Apr 1853: Reached San Carlos de Río Negro.

11 Apr–26 Nov 1853: At San Carlos and vicinity.

19 Jul 1853: Ascent of Piedra Cocuy.

27 Nov–21 Dec 1853: On the Río Casiquiare:

27 Nov 1853: Left San Carlos at 10 A.M.; reached Raudal at mouth of Río Guainía at 4 P.M.

29 Nov 1853: Reached Solano at 8 A.M.

30 Nov 1853: Reached rock of Guanari in the afternoon.

1 Dec 1853: Stayed at Guanari until noon; at 5 P.M. reached Buena Vista.

2 Dec 1853: Reached Santa Cruz at sunset.

3 Dec 1853: Reached Quirabuena after sunset.

5 Dec 1853: Passed mouth of Río Siapa a little past noon.

7 Dec 1853: Passed Cerro de Canumata on left bank at 4 P.M.

9 Dec 1853: Reached entrance of Lago de Vasiva at 2 P.M.; after 2 hrs. reached the lake.

11 Dec 1853: Reached pueblo de Ponciano on left bank at 3 P.M.; passed Caño Itiniuni [passage to Río Guainía].

13 Dec 1853: Reached deserted pueblo of Capibara early in morning.

15 Dec 1853: First view of Duida.

17 Dec 1853: Reached pueblo of Monagas called Camaciáno.

18 Dec 1853: Left Monagas a little before noon; 1½ hrs. later passed mouth of Caño Dorotomuni.

21 Dec 1853: Reached Caño de Calipo little after noon.

21–28 Dec 1853: On the Río Orinoco:

21 Dec 1853: Entered Río Orinoco between 3–4 P.M.; evening at Pueblo Viejo [Punta

Piaroa] on left bank of Río Orinoco.

23 Dec 1853: Reached playa in sight of Esmeralda.

24 Dec 1853: Reached Esmeralda at 10 A.M.

24–28 Dec 1853: Esmeralda.

28 Dec 1853: Left Esmeralda for Río Cunucunuma.

[29?] Dec 1853–6 Jan 1854: On Río Cunucunuma:

1 Jan 1854: Passed first fall of Río Cunucunuma.

2 Jan 1854: At base of second fall (Uarinama [= Guarinuma?]) at 10 A.M. start; at 5 P.M. reached the pueblo at base of third fall (Tauarupána).

2–3 Jan 1854: At Tussari's house.

4 Jan 1854: Left Tussari's pueblo early in the morning; passed first raudal.

6 Jan 1854: Entered the Orinoco at 8 A.M.

7–27 Jan 1854: On the Río Casiquiare:

7 Jan 1854: Reached mouth of Río Casiquiare at noon.

9 Jan 1854: Reached settlement of Monagas before noon.

12 Jan 1854: Reached settlement of Ponciano towards evening.

12–20 Jan 1854: At Ponciano.

21 Jan 1854: Left Ponciano; entered Vasiva towards night.

25 Jan 1854: Left Vasiva in the afternoon.

27 Jan–25 Feb 1854: On the Ríos Pacimoni and Yatúa:

27 Jan 1854: Entered mouth of Río Pacimoni a little after noon.

31 Jan 1854: Reached lower mouth of Caño Baría.

4 Feb 1854: Reached pueblo of Custodio about 4 P.M.

5–6 Feb 1854: Travel up the Río Yatúa.

6 Feb 1854: Reached Caño of Santa Isabel (Uaranaka).

[7?] Feb 1854: Reached port of Santa Isabel.

11–12 Feb 1854: Trip to Cerro Imei (Cerro de Abispa).

14 Feb 1854: Back to San Custodio.

15 Feb 1854: Ascent to Cerro Tarurumari,

- a little north of the village of San Custodio.
- [16?] Feb 1854: Descended the Pacimoni [Yatúa]; ascent of low granite rock [Laja Caipán] in the afternoon.
- 24 Feb 1854: Reached mouth of Río Pacimoni.
- 25 Feb 1854: Botanical collecting at the junction of the Río Pacimoni with Río Casiquiare.
- 28 Feb–25 May 1854: At San Carlos de Río Negro and vicinity:
- 28 Feb 1854: Arrived at San Carlos.
- Apr–May 1854: Botanical collecting around San Carlos.
- 26 May–17 Jun 1854: On the Río Guainía, Pimichín, Temi, and Atabapo:
- 26 May 1854: Left San Carlos.
- 4 Jun 1854: Reached Tomo on the Río Guainía [Colombia].
- 4–8 Jun 1854: At Tomo drying plants [Colombia].
- 9 Jun 1854: Left Tomo for Maroa and Pimichín.
- 10 Jun 1854: Reached Pimichín in the afternoon.
- [11] Jun 1854: Pimichín to Yavita.
- [12–14] Jun 1854: Yavita to San Fernando de Atabapo.
- [15–17] Jun 1854: At San Fernando de Atabapo.
- 18 Jun–5 Jul 1854: On the Río Orinoco down to Maypures:
- 18 Jun 1854: Left San Fernando de Atabapo and reached Marana [Marano].
- 19 Jun 1854: Passed Cerro de Mono on the left bank of the Río Orinoco [Colombia]; reached Maypures [Colombia] at dark.
- [20–30] Jun 1854: Journey at Maypures [Colombia].
- [1–5] Jul 1854: Maypures to San Fernando de Atabapo.
- 5 Jul–12 Aug 1854: With fever in San Fernando de Atabapo.
- 13–28 Aug 1854: Return from San Fernando to San Carlos.

- 13 Aug 1854: Left San Fernando de Atabapo.
- 20 Aug 1854: Reached Tomo [Colombia].
- 20–25 Aug 1854: Rested in Tomo [Colombia].
- 26 Aug 1854: Left Tomo.
- 28 Aug 1854: Reached San Carlos de Río Negro.
- 28 Aug–22 Nov 1854: At San Carlos de Río Negro and vicinity.
- 23 Nov 1854: Left San Carlos de Río Negro at noon.
- 24 Nov 1854: Reached mouth of Caño Guasie [= Xié, Brazil].
- According to Spruce's communication to Reichenbach f. (1873), a total number of 815 botanical collections were made by him during his stay in Venezuelan territory (nrs. 2952–3766):

Nrs.

- 2952–3157: On the Río Negro.
- 3158–3213: On the Río Casiquiare.
- 3214–3266: On the Río Orinoco [including Esmeralda and Río Cunucunuma?].
- 3267–3417: On the Río Casiquiare.
- 3418–3423, 3435: On the Río Orinoco [including Río Cunucunuma?].
- 3424–3466 [excluding 3435]: On the Río Casiquiare [including Río Pacimoni and Río Yatúa?].
- 3467–3567: At San Carlos de Río Negro and vicinity [including Río Guainía?].
- 3568–3670: At Maypures [Colombia].
- 3671–3700: On the Río Negro [including Río Guainía and Pimichín?].
- 3701–3750: On the Río Orinoco above (S) the cataracts and on the Río Atabapo.
- 3751–3766: On the Río Negro, in Venezuela.
- 3807–3823: Maypures, San Carlos (numbers added after return to Brazil).

Notes: Besides these numbers, Spruce apparently also made some collections without numbering (approximately 50–60 nrs.), as well as other collections (mainly palms) with a separate numbering sequence (ap-

proximately 20–30 nrs.?) (fide Pittier, ined.). At least 60 of the Venezuelan numbers represent collections from more than one locality or date. For at least 27 of Spruce's Brazilian numbers, Venezuelan material was later added. Spruce's collections of bryophytes were separately numbered.

It must be kept in mind that at the time of Spruce's visit to Venezuela, both shores of the Ríos Negro, Guainía, Atabapo, and Orinoco were part of Venezuela; therefore, the number of collections cited by Spruce for Venezuela includes also those made in such localities as Tomo, Cerro del Mono, San Felipe and Maypures, which today belong to Colombia. According to Prance (1971), further "care should be taken in citing Spruce's collections since many of his Venezuelan collections have often been cited as from Brazil since this is stated on the labels" (loc. cit., page 61).

According to Urban (1906) and Prance (1971), Spruce's collections were widely distributed by George Bentham to the following herbaria: B, BM, BR, DBN, E, G-BOIS, G-DC (Urban, 1906), GOET, K (main set), LE, M, P, W, and, more recently acquired also by F, GH, and NY (Prance, 1971); other European herbaria with large sets include AWH, CGE, FI, LD, and OXF.

The types of Spruce's hepatics are at MANCH. Publications: Reichenbach f., 1873; Spruce, 1908, 1970; Maguire, 1955; Prance, 1971; further details on literature referring to Spruce in Urban, 1906.

STERGIOS, BASIL

1940–; Venez; Botanist (Univ. Experimental de los Llanos "Ezequiel Zamora" UNELLEZ, Guanare, Portuguesa).

20–30 Jul 1982: San Carlos de Río Negro and Solano, Río Negro, lower Casiquiare, upper Pacimoni to lower Río Yatúa (Parque Nacional "Serranía de la Neblina") (with G. Aymard).

Nrs. 4010–4434: PORT, VEN, Regional Herbarium of MARNR, Puerto Ayacucho.

Notes: Special collections of different species of the genus *Campsiandra* (Leguminosae) for a taxonomic revision of the genus, and general collections.

STEYERMARK, JULIAN ALFRED (Map 8)

1909–; U.S.; Naturalized Venezuelan since 1973; Botanist (Field Museum of Natural History, Chicago [until 1958]; Instituto Botánico, Caracas [since 1959]).

Aug–Sep 1944: Expedition to Cerro Duida. Nrs.

57,727–57,728: Río Orinoco, Isla Hormiga (between Sanariapo and San Fernando de Atabapo), 17 Aug 1944.

57,729–58,410: Esmeralda, south slopes and summit of Cerro Duida, Esmeralda, 21 Aug–6 Sep 1944.

58,411–58,421: Around San Fernando de Atabapo, 7 Sep 1944.

58,422: Along Río Orinoco, between Tamatama and San Fernando de Atabapo, 7 Sep 1944.

58,423–58,429: Raudal Santa Bárbara, 7 Sep 1944.

58,430–58,431: Mouth of Río Sanariapo, 8 Sep 1944.

58,432–58,433: San Fernando de Atabapo [possibly a confused locality with Sanariapo], 8 Sep 1944.

58,434–58,448: Mouth of Río Sanariapo, 8 Sep 1944.

58,449–58,506: Vicinity of Sanariapo, 8 Sep 1944.

58,507: Between Sanariapo and Puerto Ayacucho, 8 Sep 1944.

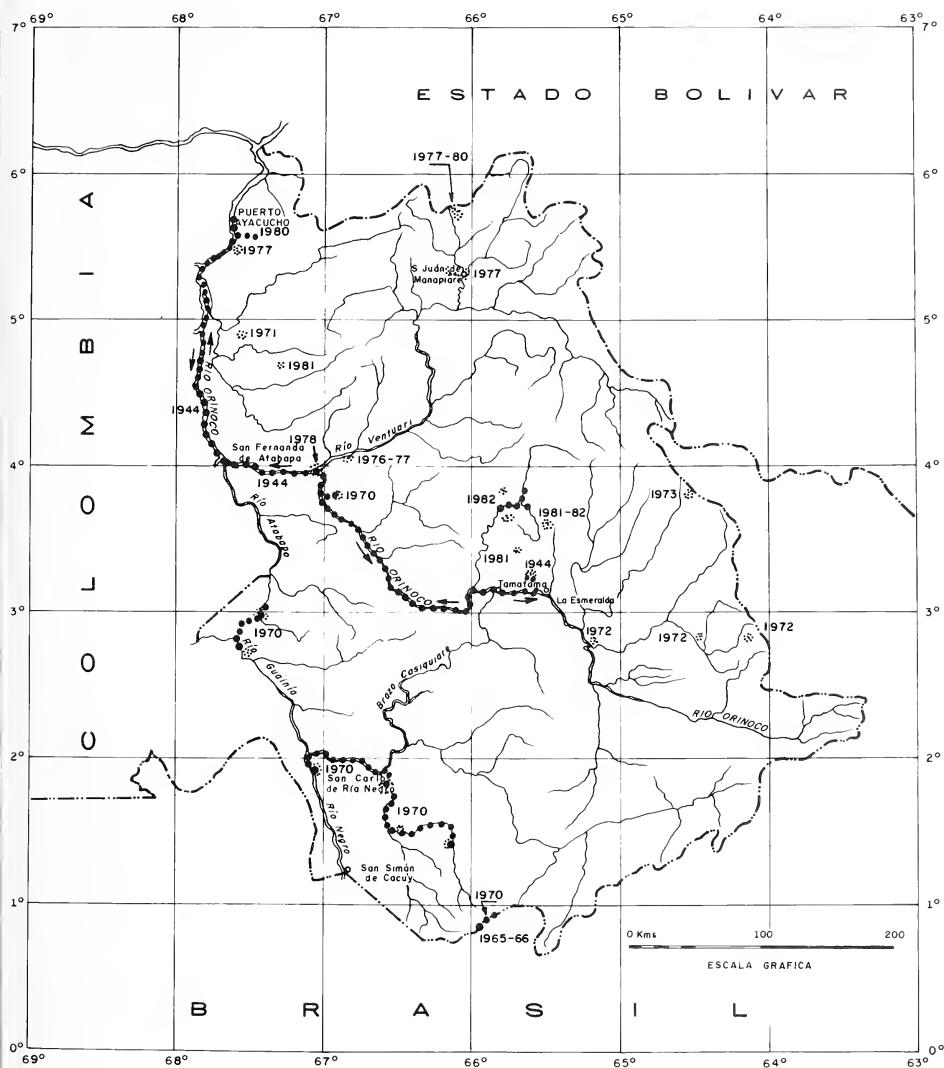
58,508–58,509: Along Río Sanariapo, 8 Sep 1944.

58,510–58,526: Vicinity of Puerto Ayacucho, 11 Sep 1944.

58,527–58,528: Along Río Orinoco at Puerto Ayacucho, 11 Sep 1944.

Notes: Exploration for the "Cinchona Mission" in Venezuela.

Publications: Steyermark and Meyer, 1945–



MAP 8.—Exploration by Steyermark, 1944-1982 (clustered dots = intensive collecting).

- 1946; Steyermark and collaborators, 1951, 1952, 1953, 1957; Steyermark, 1966.
- Apr–May 1970: Expedition to San Carlos de Río Negro, Río Pacimoni, Río Yatúa, Maroa, Pimichín, Yavita, and Cerro Yapacana (with G.S. Bunting).
- Nrs.
- 102,434–102,475: Río Pacimoni, from mouth up to Pueblo Viejo, 8 Apr 1970.
- 102,476–102,504: Pueblo Viejo, Bruno (Guaibana, open laja on left bank of Río Pacimoni), Laja Catipán (Río Yatúa, right bank), 9 Apr 1970.
- 102,505–102,525: Río Yatúa to Cerro Araucaua, 10 Apr 1970.
- 102,526–102,660: Cerro Araucaua, 11–15 Apr 1970.
- 102,661–102,663: Savannas near Pueblo Viejo, 15 Apr 1970.
- 102,664–102,674: Pueblo Viejo, Río Casiquiare, Yacami, Río Negro, 16 Apr 1970.
- 102,675–102,798: San Carlos de Río Negro and vicinity, 17–18 Apr 1970.
- 102,799–102,850: Savanna 1 km east of Maroa, Pimichín, 20 Apr 1970.
- 102,851–102,940: Road, Yavita to Pimichín, 21–22 Apr 1970.
- 102,941–102,972: Río Temi around Yavita, 22 Apr 1970.
- 102,973–103,012: Caño Cotúa, west base of Cerro Yapacana, 30 Apr 1970.
- 103,013–103,066: Southwest base of Cerro Yapacana, up to 400 m, 3 May 1970.
- 103,067–103,099: Southwest talus slopes of Cerro Yapacana, 400–825 m, 4 May 1970.
- 103,100–103,101: Between Caño Cotúa and base camp, 4 May 1970.
- 103,102–103,190: Summit of Cerro Yapacana, 1000–1200 m and lower (–825 m), 5–7 May 1970.
- 103,191–103,267: Southwest slopes of Cerro Yapacana, 825–550 m, forest at base, savannas at base, 7 May 1970.
- 103,268–103,280: Camp around Caño Co-túa, savannas, 8 May 1970.
- Oct 1970: Expedition to Cerro de la Neblina (with G.C.K. Dunsterville and C. Brewer-Carías) [helicopter expedition].
- Nrs. 103,752–103,932: [Brazil, Edo. Amazonas, Planicie de Zuloaga, 2300 m], 10–15 Oct 1970.
- Note: A large part of these Brazilian collections were lost during transport from Summit Camp at Sierra Neblina to Caracas.
- Nrs. 103,933–104,025: Venezuela, headwaters of Cañón Grande on southeast portion of Cerro Neblina, 1900 m, 16–17 Oct 1970.
- Nrs. 104,026–104,040: [Brazil, Edo. Amazonas, Mission of Maturacá on Río Maturacá], 19–20 Oct 1970.
- Notes: These Steyermark collections from Brazil are not cited in Prance (1971).
- Sep 1971: Expedition to Cerro Autana [helicopter expedition conducted by C. Brewer-Carías and supported by CODESUR].
- Nrs. 105,104–105,234, 105,236: Cerro Autana, summit, 1230 m, 20–22 Sep 1971.
- Nrs. 105,234A–105,235: Puerto Ayacucho, laja, 24 Sep 1971.
- Publications: Steyermark, 1974, 1975; Brewer-Carías, 1976.
- May 1972: Expedition to the Sierra Parima, Venezuelan-Brazilian frontier (with the Venezuelan-Brazilian Frontier Commission, helicopter expedition conducted by J. Pantchenko).
- Nrs.
- 105,904–105,947: Sierra Parima, Frontier Camp 3, 1300 m, 18 May 1972.
- 105,948: Río Putaco, affluent of Río Ocamo, 175 m, 18 May 1972.
- 105,949–106,146: Sierra Parima, Frontier Camp 3, 1100–1300 m, 19–23 May 1972.
- 106,147: Río Putaco, affluent of Río Ocamo, 175 m, 23 May 1972.
- 106,148–106,174: Mission of Ocamo, 153 m, 23 May 1972.
- Apr–May 1973: Expedition to the Sierra Par-

- ima, Venezuelan-Brazilian frontier (with the Venezuelan-Brazilian Frontier Commission, helicopter expedition conducted by J. Pantchenko).
- Nrs. 106,968–107,105: Simarawochi, headwaters of Río Matakuni, 800–860 m, 18–26 Apr 1973.
- 107,106–107,107: [Edo. Bolívar, Río Diamante Negro, 27 Apr 1973].
- 107,108–107,205: Simarawochi, headwaters of Río Matakuni, 800–870 m, 29 Apr–2 May 1973.
- 107,206–107,208: [Edo. Bolívar, Sierra Pakaraima, 2 May 1973].
- 107,209–107,211: Simarawochi, headwaters of Río Matakuni, 830 m, 2 May 1973.
- 107,212–107,381: [Edo. Bolívar, Sierra Pakaraima, 4–5 May 1973].
- 107,382–107,412: Simarawochi, headwaters of Río Matakuni, 790–800 m, 8 May 1973.
- 107,413: [Edo. Bolívar, Sierra Pakaraima, 8 May 1973].
- 107,414–107,489: Simarawochi, headwaters of Río Matakuni, 770–850 m, 10–18 May 1973.
- 107,490–107,558: Sierra Parima, Frontier Point #7, headwaters of Río Matakuni, 1450–1525 m, 19 May 1973.
- 107,559–107,571: Simarawochi, headwaters of Río Matakuni, 780–790 m, 19–23 May 1973.
- 107,570.A–107,571.A: Sierra Parima, Frontier Point #8, 1300 m, 24 May 1973.
- 28 Dec 1976: Canaripó (with P. Redmond). Nrs. 112,790–112,858.
- 2 Mar 1977: Canaripó (with P. Redmond and G. Heny). Nrs. 113,805–113,840.
- 4 May 1977: Puerto Ayacucho, Tobogán de la Selva (with P. Redmond and O. Huber). Nrs. 113,842–113,877.
- 11 Jun 1977: Puerto Ayacucho, Gavilán (valley of Río Cataniapo) (with P. Berry, O. Huber and P. Redmond). Nrs. 113,880–113,930.
- 20 Jun 1977: San Juan de Manapiare, Yutajé (with P. Redmond and M. King). Nrs. 113,932–113,954: San Juan de Manapiare and vicinity. Nrs. 113,955–113,972: Yutajé.
- 30 Apr 1978: Yutajé, Caño Coro-coro (with P. Redmond). Nrs. 117,044–117,112.
- 12 May 1978: Santa Bárbara and mouth of Río Ventuari (with O. Huber, P. Berry and P. Redmond). Nrs. 117,113–117,176.
- 22 Feb 1979: Yutajé, Caño Coro-coro (with M. Griot and P. Redmond). Nrs. 117,896–117,936.
- 9–15 May 1980: Puerto Ayacucho and vicinity, valley of Río Cataniapo, Cavilán, San Pedro de Cataniapo, Tobogán de la Selva (with G. Davidse and F. Guánchez). Nrs. 122,111–122,568.
- Notes: Botanical inventory of lower valley of the Río Cataniapo, in the area to be flooded by the construction of a dam for hydroelectrical power (Joint Program of Instituto Botánico, CONICIT, and Missouri Botanical Garden).
- 8 Nov 1980: Yutajé (with P.J.M. Maas, A. Field and P. Redmond). Nrs. 123,620–123,669.
- 15 Jan 1981: Expedition to Cerro Marahuaca and Cerro Sipapo (with B. MAGUIRE, C. Maguire and C. Brewer-Carías).
- Notes: The collections made on Cerro Marahuaca and Cerro Sipapo were originally numbered under Steyermark's numbering sequence from 124,096 to 124,245, and later transferred to Maguire's numbering sequence, 65,563–65,712 [see B. MAGUIRE]. Helicopter expedition conducted by Charles Brewer-Carías.
- Feb 1981: Expedition to Cerro Marahuaca, Cerro Duida and Cerro Sipapo (with R. Liesner and C. Brewer-Carías). Nrs. 124,336–124,356: Mission of Ocamo and

- vicinity, 15 Feb 1981.
 124,357: Esmeralda, 15 Feb 1981.
 124,358–124,523: Cerro Marahuaca, summit, 16 Feb 1981.
 124,524–124,559: Cerro Sipapo, 17 Feb 1981.
 124,560–124,582: Cerro Duida, 16 Feb 1981.
 124,583: Puerto Ayacucho, 17 Feb 1981
 Notes: Helicopter expedition conducted by Charles Brewer-Carías.
 Jan–Feb 1982: Joint expedition VEN-NY to Cerro Marahuaca, Cerro Duida, and Cerro Huachamacari (with M. Guariglia, N. Holmgren, J. Luteyn, and S. Mori).
 Nrs.
 125,635–125,695: Río Cunucunuma at Culebra, 28 Jan 1982.
 125,696–125,734: Between Culebra and north end of Cerro Duida, 28 Jan 1982.
 125,735–125,791: Río Cunucunuma at Culebra, 29 Jan 1982.
 125,792–125,818: North facing slopes of Cerro Duida, 600–800 m, 29 Jan 1982.
 125,819–125,823: North facing slopes of Cerro Duida, 400 m, 29 Jan 1982.
 125,824–125,867: Río Cunucunuma at Culebra, 30 Jan 1982.
 125,868–125,888: Base of north end of Cerro Duida, 300 m, 30 Jan 1982.
 125,889–126,104: Cerro Marahuaca, summit, 2330–2580 m, 31 Jan–4 Feb 1982.
 126,105–126,125: North end of Cerro Duida, 800–900 m, 6 Feb 1982.
 126,153–126,156: North end of Cerro Duida, 200–700 m, 6 Feb 1982.
 126,157–126,197: Along Río Cunucunuma, 6 Feb 1982.
 126,198–126,235: Río Cunucunuma, lower section of Caño Negro, 7 Feb 1982.
 126,236–126,240: Río Cunucunuma, 8 Feb 1982.
 126,241–126,271: Caño Negro, towards Cerro Duida, 200 m, 8 Feb 1982.
 126,272–126,286: North end of Cerro Duida, southwest of Culebra, 200 m, 9 Feb 1982.
 126,287: Along Río Cunucunuma, 9 Feb 1982.
 126,288–126,333: Marahuaca Massif, 2480 m, 9 Feb 1982.
 126,334–126,369: Marahuaca Massif, 2450 m, 10 Feb 1982.
 126,370–126,402: Cerro Duida, along east escarpment, 1230 m, 10 Feb 1982.
 126,404–126,411: Cerro Duida, wet savannas, 10 Feb 1982.
 126,412–126,442: Cerro Duida, north end, 1400 m, 10 Feb 1982.
 126,443–126,471: Cerro Huachamacari, summit, 1800 m, 10 Feb 1982.
 Notes: All phanerogamic collections are under STEYERMARK et al. (837 nrs.), whereas all cryptogamic collections (420 nrs.) are under GUARIGLIA et al. (see Guariglia, M.). Helicopter expedition conducted by Charles Brewer-Carías.
 Steyermark's collections from 1944 are deposited at F, NY, US, VEN; all later collections, VEN, NY, US, MO, U, K.
 Suárez, Nelly
 19?– ; Venez.; Biologist (CODESUR-MARNR, Zone 10, Puerto Ayacucho).
 Apr 1978: Río Orinoco to San Fernando de Atabapo and Santa Bárbara (with G. MORILLO and J. Camico).
 TATE, GEORGE HENRY HAMILTON
 1894–1953; U.S.; Zoologist (American Museum of Natural History, New York).
 1928–1929: "Tyler-Duida Expedition" of the American Museum of Natural History to Cerro Duida.
 Nrs.
 1–147: [Brazil: Manaus, Muyrapenima, Santa Isabel, Camanaos, Yucabi, São Gabriel, Preguiza].
 148–168: Venezuela: Piedra Alta [= Laja Alta], Río Negro, Río Casiquiare (San Sebastián, Buena Vista, Quemapure) [in irregular sequence; includes also nrs. 160–163 from San Carlos de Río Negro cited as belonging to Brazil].
 169–965: Venezuela: Esmeralda, Cerro

- Duida [south slopes and south summit], Esmeralda, 1 Oct 1928–18 Mar 1929.
- 966–1002: [Brazil: Río Negro (Yucabí, Santa Isabel, São Gabriel)].
- 1003: [Colombia: opposite mouth of Río Casiquiare].
- 1004–1051: Venezuela: Esmeralda, Cerro Duida.
- 1052–1060: [Brazil: Río Negro (Yucabí, Santa Isabel)].
- 1061–1065: Venezuela: Esmeralda [Musci]. First set at NY; dupl. at B, G, K, US.
- Notes: First ascent of a tepui in T. F. Amazonas. Tate's Brazilian collections are not cited by Prance (1971).
- Publications: Gleason, 1929, 1931; Tate and Hitchcock, 1930; Tate in Gleason, 1931.
- THOMAS, WILLIAM WAYT
- 1951–; U.S.; Botanist (Univ. of Michigan, Ann Arbor).
- 2–21 Nov 1979: Puerto Ayacucho, Cerro Yapacana (8–10 Nov), San Fernando de Atabapo (11 Nov), Maroa (15 Nov), Yavita (16, 19 Nov), Santa Cruz on the Río Atabapo near confluence with Río Atacavi and Río Temi (17–18, 20 Nov).
- Nrs. 2533–2693; MICH, VEN; some specimens also at CM and NY.
- Notes: Field research for doctoral dissertation at University of Michigan on *Rhynchospora* sect. *Dichromena* and their pollinators.
- TILLET, STEPHEN S.
- 1930–; U.S.; Botanist (UCV, Fac. de Farmacia, Herbario "Ovalles").
- 11 Feb 1974–9 Jun 1982:
- Nrs.
- 742-13–742-192: San Fernando de Atabapo and vicinity (to 20 km along trail towards Santa Bárbara; to Caño Pavón 1 hour up the Río Orinoco; to Caño Morocoto 1 hour down the Río Orinoco) (with M. Hasegawa), 11–19 Feb 1974.
- 743-193–743-240: San Fernando de Atabapo and vicinity (Caño Morocoto 1 hour downstream on Río Orinoco) (with A. Gentry and N. Ferrigni), 23–26 Mar 1974.
- 745-249–746-452: San Fernando de Atabapo and vicinity (Caño Morocoto and Sabana Morocoto, 1 hour downstream on Río Orinoco; to 20 km along trail towards Santa Bárbara; Río Orinoco upstream to Isla Guacamayo, Matacamí; vicinity of Santa Bárbara; 2 hours upstream on Río Atabapo, Caño Cumare and Chamuchina) (with L. Gutiérrez), 27 May–3 Jun 1974.
- 751-16–752-378: Cerro Duida, Cerro Marahuaca (partly with P. Colvée), 29 Jan–10 Feb 1975.
- 777-57–777-126: Puerto Ayacucho and vicinity; Isla Ratón; Gavilán (with O. Huber and H. Jiménez), 19–23 Jul 1977.
- 782-28–782-143a: Savannas and forests at west base of Cerro Yapacana; Santa Bárbara (with O. Huber and A. Rojas), 15–27 Feb 1978.
- 7811-162–7812-337: Caño Perro de Agua, Caño Cotúa, savannas at west base of Cerro Yapacana, Caño Yagua, Santa Bárbara, and trail towards San Antonio (with O. Huber), 29 Nov–12 Dec 1978.
- 794-76–795-287: Caño Caname, Río Atabapo, Río Orinoco, west base of Cerro Yapacana, Caño Yagua, Santa Bárbara (with G. Davidse and O. Huber), 25 Apr–10 May 1979.
- 807-36–807-310: Puerto Ayacucho, Río Autana, Río Sipapo, Río Guayapo, Santa Bárbara, Caño Yagua, Laguna Yagua, Trapichote (with O. Huber and A. Zinck, "Heli-trip-VI"), 14–28 Jul 1980.
- 811-4–811-19: Puerto Ayacucho and vicinity, Gavilán (with K. Brown, Jr.), 5–6 Jan 1981.
- 8111-113–8111-122: Puerto Ayacucho and vicinity, Galípero (with O. Huber), 25 Nov 1981.
- 825-9–826-138: Guachapana, Mata de Palma, Caño Yagua, Río Puruname (with O. Huber), 24 May–9 Jun 1982.
- All collections are at MYF and VEN; collections from Cerro Duida and Cerro Marahuaca also at NY, HB, K, and U.
- Notes: Dr. Tillett uses a compound numera-

tion system including the year (first two digits), the month (next one or two digits), and finally (following the hyphen) the sequential numeration from one on for each year. Many specimens are voucher specimens of bulk samples of leaves, wood, and bark for pharmacological screening at the laboratories of the Facultad de Farmacia, UCV, Caracas.

Specialist on New World Passifloraceae and ethnobotany; founder and curator of the Herbario "M. OVALLES" (MYF) at the Faculty of Pharmacy of Universidad Central de Venezuela (UCV) in Caracas since 1974.

Publications: Norambuena, 1975; Tillett and Steyermark, 1982.

Trujillo, A.

192?- ; Venez.; Field assistant.

16-26 Nov 1977: Puerto Ayacucho, Reserva Forestal del Sipapo (Río Cuao, Río Sipapo) (with G. MORILLO).

TRUJILLO, BALTASAR

1927- ; Venez.; Botanist (UCV, Fac. de Agronomía, Maracay).

18-29 Mar 1979: Puerto Ayacucho and vicinity (with J. Pulido).

Nrs. 14933-15287; MY.

UHL, CHRISTOPHER

1949- ; U.S.; Ecologist (Univ. of Georgia, Athens, U.S.A.).

Sep-Dec 1974: San Carlos de Río Negro and vicinity, IVIC study sites.

Approximately 250 nrs.; VEN.

17-24 Sep 1975: San Carlos de Río Negro and vicinity, road to Solano (IVIC study sites) (with P. Berry).

1975-present: San Carlos de Río Negro and vicinity (IVIC study sites; mainly successional (disturbed) areas).

Approximately 75 nrs.; MO.

Publications: Uhl et al., 1981, 1982.

Universidad Central de Venezuela (UCV)

Principal and largest university of Venezuela, located in Caracas and Maracay (Agronomy and Veterinary Faculties).

Botanical collectors of UCV in T. F. Amazonas (* = under temporary contract):

AGOSTINI, GETULIO (Fac. de Ciencias, Caracas)

ARISTEGUIETA, LEANDRO (Fac. de Ciencias, Caracas)

* BRÜCHER, HEINZ (Fac. de Ciencias, Caracas)

* BUNTING, GEORGE S. (Fac. de Agronomía, Maracay)

CÁRDENAS DE GUEVARA, LOURDES (Fac. de Agronomía, Maracay)

CASTILLO, ANÍBAL (Fac. de Ciencias, Caracas)

CORTÉZ, ALVARO O. (Fac. de Ciencias, Caracas)

* EWEL, JOHN J. (Fac. de Agronomía, Maracay)

FARIÑAS, MARIO (Fac. de Ciencias, Caracas)

FERNÁNDEZ, ANTONIO (Fac. de Agronomía, Maracay)

FERRIGNI, NELSON (Fac. de Farmacia, Caracas)

FOLDATS, ERNESTO (Fac. de Ciencias, Caracas)

GUARIGLIA, MARIO (Fac. de Ciencias, Caracas [until 1979]).

GUINAND, LUISA F. (Fac. de Ciencias, Caracas)

Gutiérrez, Luis (Fac. de Farmacia, Caracas)

Hasegawa, Masahisa (Fac. de Ciencias, Caracas)

HERNÁNDEZ RAMOS, JUAN F. (Fac. de Agronomía, Maracay)

Iturriaga, Teresa (Fac. de Ciencias, Caracas)

Jaffée, Werner (Fac. de Ciencias, Caracas)

Jiménez, Hernán (Fac. de Farmacia, Caracas)

MEDINA, ERNESTO (Fac. de Ciencias, Caracas [until 1970])

MONDOLFI, EDGARDO (Fac. de Ciencias, Caracas)

ORTÍZ, RAFAEL (Fac. de Ciencias, Caracas)

PANNIER, FEDERICO (Fac. de Ciencias, Caracas)

PARRA RONDÓN, ROMELIA (Fac. de Agronomía, Maracay)

Reyes, E.A. (Fac. de Farmacia, Caracas)

- Rojas, Aníbal (Fac. de Ciencias, Caracas)
- RUIZ ZAPATA, THIRZA (Fac. de Agronomía, Maracay)
- RUTKIS, EDGARS (Fac. de Ciencias, Caracas)
- TILLET, STEPHEN S. (Fac. de Farmacia, Caracas)
- TRUJILLO, BALTASAR (Fac. de Agronomía, Maracay)
- VARESCHI, VOLKMAR (Fac. de Ciencias, Caracas)
- Velásquez, Justiniano (Fac. de Ciencias, Caracas)
- Zorrilla, C.J. (Fac. de Farmacia, Caracas)
- Universidad de Los Andes (ULA)
- Second major Venezuelan university, located at Mérida.
- Botanical collectors of ULA in T. F. Amazonas (* = under temporary contract):
- AREND, ERNESTO (Fac. de Ciencias Forestales)
- Bautista, Jaime (Fac. de Ciencias Forestales)
- CARABOT C., ALFREDO (Fac. de Farmacia)
- MARCANO-BERTI, LUIS (Fac. de Ciencias Forestales)
- Morales, Antonio (Fac. de Farmacia)
- Rodríguez, Henry (Fac. de Ciencias Forestales)
- RUIZ TERÁN, LUIS (Fac. de Ciencias Forestales [until 1968]; Fac. de Farmacia [1969–1979])
- Salcedo, Pedro (Fac. de Ciencias Forestales)
- VEILLÓN, JEAN PIERRE (Fac. de Ciencias Forestales)
- * WESSELS-BOER, JAN G. (Fac. de Ciencias Forestales)
- VARESCHI, VOLKMAR
- 1906–; Venez.; Botanist, ecologist (UCV, Fac. de Ciencias, Caracas).
- 5 Jan–16 Feb 1958:
- Nrs. 6541–6806: Río Orinoco, Esmeralda, Río Ocamo, Río Casiquiare, Río Negro, Río Guainía, Caño Pimichín, Yavita, Río Temi, Río Atabapo, Río Orinoco ("Humboldt-Gedächtnis-Expedition 1958" [Humboldt Memorial Expedition]) (with K. Mägdefrau); VEN, NY.
- 29 Aug–20 Sep 1960: Puerto Ayacucho, Sanariapo, Río Atabapo, Río Atacavi (botanical collections made by E. FOLDATS).
- 1 Apr 1961–10 Feb 1973:
- Nrs.
- 7546–7571: Puerto Ayacucho, Río Orinoco, Río Atabapo, Laja Pavón; 1–10 Apr 1961; VEN.
- 7758–7824: Bifurcation Orinoco-Casiquiare; 21 Oct 1962; VEN.
- 7982–7987: Sabanas de Esmeralda, 8 Dec 1963; VEN.
- 7992–8017: Puerto Ayacucho, Río Orinoco, Río Atabapo, Río Orinoco, Río Cunucunuma, Esmeralda, Ocamo (with W. Jaffée), 5–21 Aug 1964; VEN.
- 8158–8182: Sabana de Simada-Vochi [Sierra Parima, headwaters of Río Matacuni], 9 Jul 1967; VEN.
- 8674–8696: Upper Orinoco, Platanal (Mahékodo-terí); 10 Feb 1973; VEN.
- Notes: Vareschi has made a total of 15 field trips to T. F. Amazonas, many of them together with his late friend Dr. Egon Herbig, medical doctor and expert bush pilot, carrying on numerous studies on plant ecology, phytogeography, black and white waters, etc.
- Publications: Vareschi, 1959, 1963a,b, 1980.
- VEILLÓN, JEAN PIERRE
- 1914–; Swiss; Forester (ULA, Fac. de Ciencias Forestales, Mérida).
- 7–19 Feb 1978: San Carlos de Río Negro and vicinity; road to Solano.
- Nrs. 1–23; VEN.
- Velásquez, Justiniano
- 1937–; Venez.; Botanist (UCV, Fac. de Ciencias, Caracas).
- 22 Jan–25 Feb 1969: Esmeralda, Cerro Duida, Caño Casiquiare (with M. FARIÑAS and E. Medina)
- Notes: Member of the "Expedición Científica AsoVAC al Alto Orinoco."
- Publication: Medina, 1969.
- Villa, Nestor
- 192?–; Venez.; Field assistant.
- 1–9 Feb 1977: San Carlos de Río Negro and

vicinity (with G. MORILLO).

WALLACE, ALFRED RUSSEL

1823-1913; Brit.; Biologist.

1 Feb-31 Mar 1851: Caño Pimichín, Yavita.

Notes: All collections lost in fire on ship in Atlantic 6 Aug 1852.

Publications: Wallace, 1853; Wurdack, 1960.

WEISS, LOUIS

18??-???: ? ; ?

1907-1908: Upper Río Negro [Brazil only?] (with H. Schmidt).

? nrs.; main set at NY.

Notes: Collected mainly mosses and fungi.

Publications: Barnhart, 1965; Prance, 1971.

WESSELS BOER, JAN GERARD

1936- ; Dutch; Botanist (ULA, Fac. de Ciencias Forestales, Mérida; Univ. of Utrecht).

Aug 1967: Puerto Ayacucho and vicinity.

? nrs.; VEN, U, K, MER.

Notes: Specialist on New World Palmae (Arecaceae). His collections in T. F. Amazonas range around his collection nr. 2300.

WILLIAMS, LEWELYN (Map 9)

1901-1980; U.S.; Economic botanist (Ministerio de Agricultura y Cría, Caracas).

May-Jun 1940: First expedition to T. F. Amazonas.

Nrs.

12965-13158: Puerto Ayacucho, Sanariapo, 18-27 May 1940.

13159-13246: Isla Ratón, 30 May-2 Jun 1940.

13247: Puerto Ayacucho, 3 Jun 1940?

Notes: The following irregular numbers lack definite dates:

Nrs.

13421: Isla Ratón, Jun 1940.

13425-13427: Isla Ratón, Jun 1940.

13428-13442: Puerto Ayacucho, Jun 1940.

13443: Isla Ratón, Jun 1940.

13444: Puerto Ayacucho, ?

13446: Isla Ratón, Apr 1940?

13447-13465: Puerto Ayacucho, Apr-Jun 1940?

13467: Puerto Ayacucho, Jun 1940.

13482: Puerto Ayacucho, Jun 1940.

13484: Puerto Ayacucho, Jun 1940.

13485-13488: Sanariapo, Jun 1940.

13489-13490: Isla Ratón, Jun 1940.

13491-13492: Puerto Ayacucho, Jun 1940.

Jan-Jul 1942: Second expedition to T. F. Amazonas.

Nrs.

13800-13824: Forests and savannas around Puerto Ayacucho, 11-13 Jan 1942.

13825: Mouth of Río Sanariapo, 15 Jan 1942.

13826-13847: San Fernando de Atabapo and vicinity, 17-18 Jan 1942.

13848-13854: Río Atabapo, Caño Rana, 19 Jan 1942.

13855-13859: Raudal Chamucina, Isla Sapo, 19 Jan 1942.

13860-13861: Mouth of Río Yavita [Río Temi?], 20 Jan 1942.

13862-13867: Río Temi, Yavita, 21 Jan 1942.

13868-14040: Yavita and vicinity, 22-28 Jan 1942.

14041-14179: Río Temi, Yavita and vicinity, 28 Jan-4 Feb 1942.

14180-14188: Forests of Pimichín, 7 Feb 1942.

14189-14370: Maroa and vicinity, 9-14 Feb 1942.

14371-14436: Maroa and vicinity, 16-20 Feb 1942.

14437-14445: Pimichín, 20 Feb 1942.

14446-14448: Maroa and vicinity, 21 Feb 1942.

14449-14458: Río Guainía, 23-25 Feb 1942.

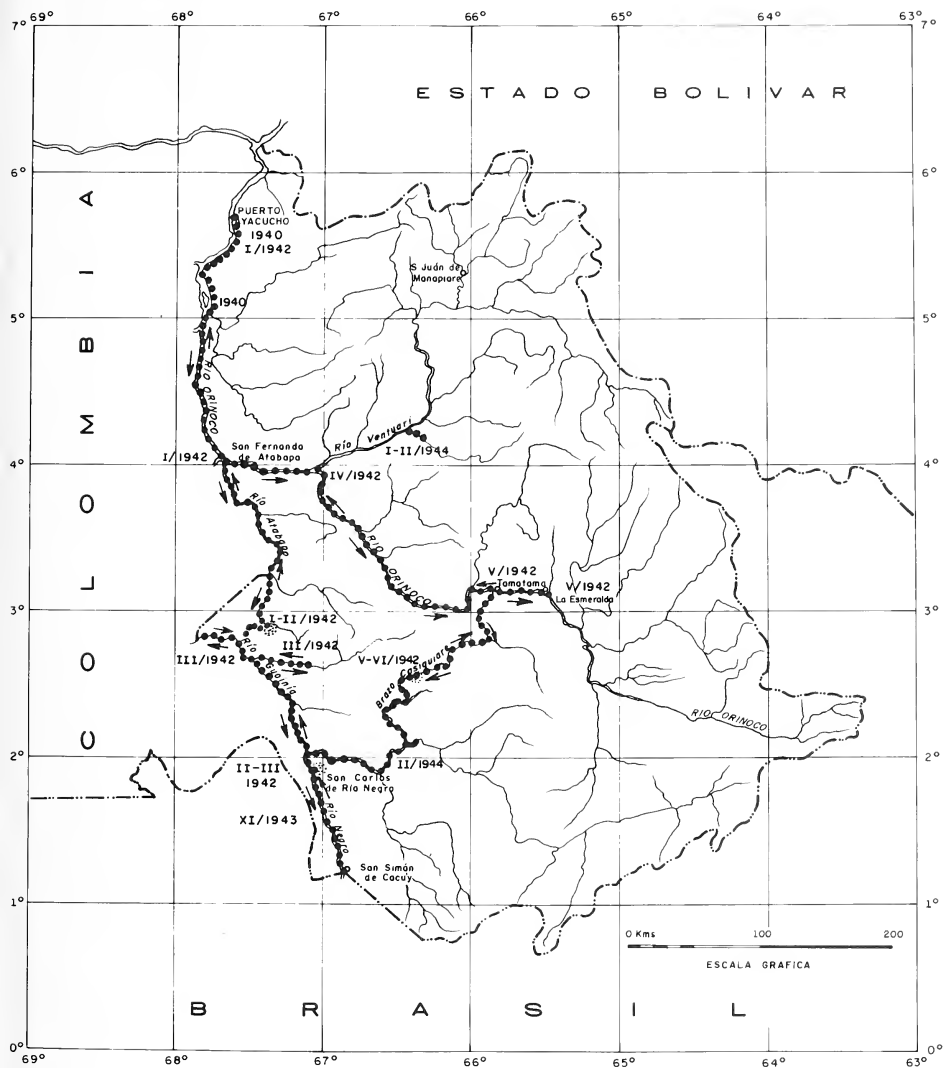
14459-14693: San Carlos de Río Negro, 26 Feb-7 Mar 1942.

14694-14710: Santa Rosa de Amanadona, 7-8 Mar 1942.

14711-14719: El Cocuy, 8 Mar 1942.

14720-14726: San Carlos de Río Negro, 9 Mar 1942.

14727-14733: Río Casiquiare, Solano, 10 Mar 1942.



MAP 9.—Exploration by Williams, 1940-1944 (roman numeral = month, clustered dots = intensive collecting).

- 14734-14785: Solano and vicinity, 11-12 Mar 1942.
- 14786-14796: Confluence Ríos Guainía and Negro, 13 Mar 1942.
- 14797-14800 Río Guainía, 17 Mar 1942.
- 14801: Solano, 14 Mar 1942 [out of temporal sequence].
- 14802-14809 Maroa, 19 Mar 1942.
- 14810: Río Guainía, 20 Mar 1942.
- 14811-14849: Victorino, 21-22 Mar 1942.
- 14850-14927: Caño San Miguel, Río Guainía, 23-27 Mar 1942.
- 14928-14948: Caño Pimichín, 31 Mar-1 Apr 1942.
- 14949-14951: Pimichín to Yavita, 2 Apr 1942.
- 14952-14958: Yavita, 3 Apr 1942.
- 14959-14963: Río Sanariapo, 15 Apr 1942.
- 14964-14968: Minisia, 18 Apr 1942.
- 14969-14977, 14981: Guarinuma (Río Atabapo), 10 Apr 1942 [out of temporal sequence].
- 14978: San Fernando de Atabapo, 17 Apr 1942 [out of temporal sequence].
- 14979-14980: Siquita, 12 Apr 1942 [out of temporal sequence].
- 14982-15002: Raudal Trapichote (Río Orinoco), 20-21 Apr 1942.
- 15003-15006: Raudal San Francisco (Río Orinoco), 20 Apr 1942.
- 15007: Raudal Santa Bárbara, 25 Apr 1942.
- 15008-15084: San Antonio de Orinoco, 26-28 Apr 1942.
- 15085: Mouth of Caño Pato, 29 Apr 1942.
- 15086-15164: Tamatama, 2-5 May 1942.
- 15165-15189: Bifurcation of Orinoco into Casiquiare, 5 May 1942.
- 15190-15221: Tamatama, 6-7 May 1942.
- 15222-15244: Between Tamatama and Esmeralda, 7 May 1942.
- 15245-15301: Tamatama, 7-9 May 1942.
- 15302-15516: Esmeralda, 13-19 May 1942.
- 15517-15519: Upper Casiquiare, 21-22 May 1942.
- 15520-15832: Capihuara [= Capibara, on the Río Casiquiare], 23 May-9 Jun 1942.
- 15833-15869: Tamatama, 12-14 May 1942 [excluding nr. 15836, collected at Capihuara on 10 May 1942].
- 15870: Between mouth of Río Parguaza and Raudal Atures, 14 Jun 1942 [doubtful locality].
- 15871-15944: Puerto Ayacucho, Raudales de Atures, 25-27 Jun 1942.
- 15945: Puerto Ayacucho, 1 Jul 1942.
- 15946-16068: Mouth of Río Sanariapo, Sanariapo, 2-6 Jul 1942.
- 16069-16072: Puerto Ayacucho, 8 Jul 1942.
- Notes: The following nrs. 16,073-16,178 have been collected in different localities of T. F. Amazonas during different months of the year 1942, without indication of exact date:
- Nrs.
- 16,073, 16,078-16,082, 16,088-16,092, 16,109, 16,113, 16,142, 16,154, 16,167-16,172: Capihuara (Río Casiquiare), Jun 1942.
- 16,074-16,075, 16,083-16,086, 16,103, 16,107-16,108, 16,137, 16,143-16,144, 16,146-16,153, 16,164, 16,166, 16,173-16,177: Esmeralda, Jun 1942.
- 16,076, 16,087, 16,098, 16,100-16,102, 16,104-16,106, 16,110-16,112, 16,114-16,122, 16,126, 16,130-16,136, 16,138, 16,155-16,156, 16,177: Yavita, Jan, Feb, and Jun 1942.
- 16,077, 16,128, 16,158, 16,162: San Carlos de Río Negro, Apr and Jun 1942.
- 16,129: Isla Guarinuma (near San Carlos de Río Negro), Feb 1942.
- 16,099, 16,123-16,125, 16,139-16,141, 16,159, 16,178: Maroa, Feb-Mar 1942.
- 16,097, 16,127, 16,145, 16,157, 16,160-16,161, 16,165: Tamatama, Jun 1942.
- 16,093, 16,163: Río Sanariapo, Jun-Jul 1942.
- 16,094-16,096: Puerto Ayacucho, Jun 1942.

Notes: During 1942 to 1944, Dr. Williams

served as Senior Field Technician in the Rubber Development Corporation, in charge of organizing and supervising the procurement of wild rubber in the upper Orinoco-Casiquiare basin. During this period the following botanical collections were made in T. F. Amazonas:

Nrs.

16179–16183: Capihuara (Río Casiquiare), 3 Oct 1943.

16184: San Carlos de Río Negro, 30 Nov 1943.

16185: Santa Rosa de Amanadona, 30 Nov 1943.

16186–16187: Jojú [?], Casiquiare, Jan 1944.

16188: Playa Candela (middle Río Casiquiare), Feb 1944.

16189, 16193–16199: Caño Yureba (middle Río Ventuari), Jan 1944 [out of temporal sequence].

16200–16201: Caño Catirico (middle Río Casiquiare), Feb 1944.

16202–16203: Santa Rosa de Casiquiare, Feb 1944.

16204: Playa Candela (middle Río Casiquiare), Feb 1944.

16205–16206: San José (lower Río Casiquiare), Feb 1944.

16207: Lower Río Siapa, Feb 1944.

Notes: All typewritten field notes at VEN. Botanical specimens collected in quadruplicate: first set at F; duplicate at VEN, NY, US. Several thousand wood samples at MAD ("Samuel J. Record Memorial Wood Collection").

The data referring to the last expedition in 1943–1944 are sometimes confused and out of temporal and/or geographical sequence. Williams also made extensive botanical and wood collections in the Caura and Paragua basins (northeast of T. F. Amazonas) during 1939–1940.

Wood, Charles

19??– ; U.S.; Botanist (U.S. Peace Corps in

Venezuela).

23–30 Apr 1974: Puerto Ayacucho, San Carlos de Río Negro and vicinity (with G. MORILLO and B. de Morillo).

WURDACK, JOHN JULIUS

1921– ; U.S.; Botanist (New York Botanical Garden).

2 Nov 1950–21 Jan 1951: Cerro Duida, Cerro Huachamacari, Cerro Yapacana, Cerro Moriche (with B. MAGUIRE and R.S. Cowan).

31 Jan–21 Feb 1951: Cerro Parú (Asisa) (with R.S. COWAN).

21–23 Feb 1951: Santa Bárbara del Orinoco (with R.S. COWAN).

15 Mar–24 Apr 1953: Upper Río Orinoco, Río Casiquiare, Río Negro, down to Piedra Cocuy, Río Guainía (with B. MAGUIRE and C.K. Maguire).

7 Nov 1953–18 Feb 1954: Río Orinoco, Río Atabapo, Río Casiquiare, Río Guainía, Río Pacimoni, Río Yatúa, Cerro de la Neblina (with B. MAGUIRE and G.S. Bunting).

9 Dec 1955–28 Jan 1956: Middle Orinoco (with J.V. Monachino).

Nrs. 39750–39999, 40849–41427: [Only a few collections were made in T. F. Amazonas, on the Río Orinoco between Puerto Ayacucho and the mouth of Río Meta, during the first days of the expedition.]

11 Sep–16 Oct 1957: Upper Río Orinoco, Río Atabapo, Río Guainía, Río Casiquiare, Río Pacimoni (with B. MAGUIRE, C.K. Maguire, and W.M. Keith, Jr.).

17 Oct 1957–14 Jan 1958: Río Pacimoni, Río Yatúa, Cerro de la Neblina, and upper Río Orinoco (with B. MAGUIRE and C.K. Maguire).

29 May–8 Aug 1959: Middle and upper Río Orinoco, Río Atabapo, Río Casiquiare, Río Guainía, Río Pacimoni, Río Siapa up to Raudal Gallineta (with L. Adderley).

Nrs. 42,656–43,798; NY, VEN, US, MO, F, U, K, BM and others.

Notes: Specialist on New World Melastomataceae, Polygalaceae. Member of the "New York Botanical Garden's Exploration Program of the Flora of the Guayana Highland" during 1950–1959 (see Map 5).

YERENA, EDGARD

1960–; Venez.; Student of biology.

5–18 Nov 1982: Caño Iguana, tributary of Río Asita (5°24'N, 65°34'W, 300 m), upper Ventuari basin.

Nrs. 1–66; MYF.

Notes: Ethnobotanical collections among Hoti Indians; part of the collections accompanied by W. Coppens.

Zinck, Alfred

1938–; Venez.; Soil scientist (MARNR, Caracas).

4–6 Aug 1978: Puerto Ayacucho and surroundings (with O. HUBER).

14–16 Jul 1980: Puerto Ayacucho to Río Autana (with S. TILLET and O. Huber, "Heli-trip-VI" [first part only]).

Zorrilla, C.J.

1953–; Venez.; Pharmacy student (UCV, Fac. de Farmacia, Caracas).

28 Jan–8 Feb 1975: Esmeralda and vicinity, base of Cerro Duida (with N. FERRIGNI and E.A. Reyes).

LIST OF POSSIBLE COLLECTORS

The following persons may have collected plants in T. F. Amazonas, but no specimens have been seen by us, nor have they been cited in pertinent taxonomic or floristic literature concerning the Territorio Federal Amazonas:

Biocca, Ettore (Italian biologist, visited Ocamo coming from Maturacá [Brazil] during 1963).

Chagnón, Napoleon A. (U.S. anthropologist, studied Yanomami Indians at Mavaca during 1964–1972).

Good, Kenneth (U.S. anthropologist; research, since 1976, on protein consumption among Yanomami Indians of the upper Orinoco and Siapa).

Hames, Raymond B., and I.L. Hames (U.S. anthropologists; research, since 1976, on cultural ecology, including In-

dian basketry, in the Padamo region; Hames and Hames, 1976).

Kaplan, Joanna and Myron (British anthropologists, studying Piaroa Indians and their ethnobotany during 1969–1970, and 1977).

Missionaries, of the evangelic "New Tribes Missions" (mainly U.S. citizens).

Missionaries, of the Catholic Missions ("Padres Salesianos" [e.g., Padre Cocco], and Jesuits; mainly Italian and Spanish citizens).

Zerries, Otto (German anthropologist, research on Yanomami Indians at Platanal, during 1954–1955, with M. Schuster; cites plant collections on page 17 of his publication "Mahekodotedi" [1974]; possibly they are deposited at M?).

Remarks on Future Explorations

As is indicated on Map 10, most of the botanical collections made in T. F. Amazonas have been concentrated along riverine lowland areas and on the main mountains. There still remain large areas that have never been visited by any botanist, and their exploration is the great challenge for future generations of field botanists in this remote part of Venezuela.

The following list contains the approximate total amount of botanical specimens collected by the twenty most important main collectors in T. F. Amazonas during the last 200 years.

Maguire and collaborators	9000
Huber	6000
Steyermark	3900
Liesner	3000
Williams	2800
Guánchez	2300
Morillo	2000
Tillett	1900
Clark, H.	1800
Davidse	1500
Wurdack	1250
Croizat	1200
Colchester	1000
Tate	870
Delascio	840
Berry	835
Spruce	815
Ruiz Terán	760
Bunting	760
Lister	750
Total	43,280

It may be inferred from the above list that, thus far, approximately 50,000 numbers of botanical specimens (without the inclusion of duplicates) have been accumulated by all the collectors from the entire Territorio. We estimate very roughly that these represent approximately 3000 to 5000 species known from the Venezuelan portion of the Amazon basin.

Doubtless, a few limited regions of T. F. Amazonas may be considered today to be adequately explored and known floristically; these include the region between Puerto Ayacucho and Samariapo, the summit region of Cerro Autana, the area around San Carlos de Río Negro, and, to a certain extent, that around Esmeralda. However, there is little or no botanical knowledge of many other regions, and each trip in them results in new and noteworthy additions to the flora of the Territorio as well as taxa new to science. Remarkable in this respect are the Manapiare basin, which shows very interesting phyto-geographical connections with areas in central Brazil, and the region south of the Casiquiare River, which is still very poorly known, especially the lowlands towards the southeast. Among upland areas, many tepuis need much more exploration, especially the slope vegetation; these include the massif Cuao-Sipapo-Paraque, Cerro Guanay, Cerro Camani, Cerro Yaví, Cerro Parú, and Ser-

ranía de la Neblina. Even Cerro Duida, which has received thus far the most intensive botanical collecting (13 expeditions), still has many unexplored parts, especially in the central and marginal eastern and western sections. Cerro Marahuaca, which was for a long time inaccessible, has received much attention during the last few years, but large areas within that great massif still remain unvisited by any naturalist.

One of the least explored areas of T. F. Amazonas is the south-easternmost section, including the basin of the Río Matapire, the adjacent Sierra del Unturán, and the huge massif formed by Serranía de la Neblina, Cerro Avispa, and Cerro Aracamuni. A large expedition with the duration of one entire year is planned to the "Sierra de la Neblina" National Park for the end of 1983, and it is expected that many new and interesting taxa will be discovered during this undertaking.

Undoubtedly, the T. F. Amazonas harbors still many, many botanical treasures to be discovered in the future. We feel confident that Venezuela is fully aware of its privilege in possessing one of the richest and most promising centers of biological diversity and speciation in the entire world. The efforts of the many persons mentioned in this paper are only an initial step towards understanding this biological paradise.

References

The following list of references deals mainly with publications concerning the collectors, their itineraries, and other botanical or geographical accounts of their travels in the Territorio Federal Amazonas. Purely systematic or taxonomic publications or descriptions of new species discovered on the expeditions are generally not included here, because this would involve a separate treatment. It should be mentioned, however, that the majority of taxonomic literature referring to new species discovered in the T. F. Amazonas during the last 50 years has been published in the series "Botany of the Guayana Highland," edited by Bassett Maguire and published in the *Memoirs of the New York Botanical Garden* since 1953. Other examples have appeared in *Feldiana*, *Bulletin of the Torrey Botanical Club*, *Brittonia*, *Boletín de la Sociedad Venezolana de Ciencias Naturales*, *Acta Botanica Venezuelica*, *Phytologia*, and some other journals devoted to tropical American botany. In addition, local, regional, and continental "floras," such as *Flora Neotropica*, *Flora de Venezuela*, *Flora of Suriname*, *Flora Brasiliensis*, and *Projeto Flora Amazônica*, contain useful information on taxonomic results of botanical exploration undertaken in the Territorio Federal Amazonas and adjoining areas.

Aeroservice

1972. *Levantamiento radar de Venezuela sur*. 3 volumes, maps 1:250,000. Caracas: Ministerio de Obras Públicas, CODESUR.

Anduze, P.J.

- [1958?]. *Shailili-Ko: Descubrimiento de las fuentes del Orinoco*. 412 pages. Caracas.

Anonymous

1949. El Cerro Sipapo y las mesas de Guayana. *El Farol*, 10(125):18–21.
[1956?]. *Expédition "Elata": Voyage de S.M. le Roi Léopold III de l'Orénoque au Rio Negro*. 109 pages. [Bruxelles]: Éditions Vromant.

Arnal, P.

1943. *Exploraciones botánicas en Venezuela*. 75 pages. Caracas: Instituto Pedagógico Nacional.

Barnhart, J.H.

1965. *Biographical Notes upon Botanists*. 3 volumes, 563, 549, and 545 pages. Boston: G.K. Hall.

Bentley, C.

1841. *Twelve Views in the Interior of Guiana*. 38 pages, London: Ackermann and Co.

Berry P.

1976. *Estudio bibliográfico y taxonómico preliminar sobre palma "Seje"*. 13 pages. Caracas: Ministerio de Obras Públicas, CODESUR.

Botting, D.

- 1968a. Hovercraft in Amazonas, I. *The Geographical Magazine* (London), 41(1):11–23.
1968b. Journey of Hovercraft "El Fantástico" (Part 2). *The Geographical Magazine* (London), 41(2):97–106.

Branston, B.

1970. *The Last Journey on Earth*. 256 pages. London: Hodder & Stoughton.

Brewer-Carías, C.

1976. Cuevas del Cerro Autana. *Natura*, 58:33–48.
1978. *La vegetación del mundo perdido*. 223 pages. Caracas: Fundación Eugenio Mendoza.

Canales, H., and A. Catalán

1981. Evaluación de los efectos de un aprovechamiento forestal en el bosque de transición-alto-medio-denso (Limón de Parhuéna—Territorio Federal Amazonas). *Serie Informes Científicos*, DGSIIA/IC/06: ix + 48 pages. Caracas: Ministerio del Ambiente y de los Recursos Naturales Renovables.

Carabot C., A., and A. Usabillaga

1981. Nuevas fuentes de diosgenina en plantas de Venezuela, I. *Revista Latinoamericana de Química*, 12(3–4):132–134.

Catalán, A.

1980. Inventario de los recursos forestales de la reserva forestal del Sipapo, Territorio Federal Amazonas. *Serie Informes Científicos*, ZONA-10/IC/80: 2 volumes. Puerto Ayacucho: Ministerio del Ambiente y de los Recursos Naturales Renovables.

Chaffanjon, J.

1889. *L'Orénoque et le Caïra*. 351 pages. Paris: Librairie Hachette et Cie.

Chesney, L.

1979. Inventario de los recursos forestales de la subcuenca Manapiare-Parucito, Territorio Federal Amazonas. *Serie Informes Científicos*, DGIIA/IC/04/79: xvii + 385 pages, 2 volumes. Caracas:

- Ministerio del Ambiente y de los Recursos Naturales Renovables.
- Civrieux, M. de
1957. Un mapa indígena de la cuenca del alto Orinoco. *Memoria [de la] Sociedad de Ciencias Naturales La Salle*, 17(47):73–84.
- Clark, H., and R. Liesner
In prep. Checklist of Plants of San Carlos de Río Negro. [The University of Georgia, Institute of Ecology.]
- Clark, K.
In press. Significance of Fishing Activities for Human Nutrition in San Carlos. In E. Medina, editor, *Ecology of Tropical Rain Forests of the Upper Río Negro Basin*. Caracas: Instituto Venezolano de Investigaciones Científicas.
- Colchester, M.
Ms. The Use and Abuse of Ecology, Amazonian Subsistence: Protein Deficiency or Data Deficiency? The manuscript is in the personal files of M. Colchester, Oxford, England.
1982. The Economy, Ecology and Ethnobiology of the Sanema Indians of South Venezuela. 690 pages. Doctoral dissertation, Department of Ethnology and Prehistory, Oxford University, England.
In press. Ecological Modelling and Indigenous Systems of Resource Use: Some Examples from the Amazon of South Venezuela. *Antropología*.
- Colchester, M., and J.R. Lister
Ms. The Ethnobotany of the Orinoco-Ventuari Region: An Introductory Survey. Approximately 450 pages. The manuscript is in the personal files of M. Colchester, Oxford, England.
- Colvée, P.
1973. Cueva en Cuarcitas en el Cerro Autana, Territorio Federal Amazonas. *Boletín de la Sociedad Venezolana de Espeleología*, 4(1):5–13.
- Comisión para el Desarrollo del Sur de Venezuela (CODESUR)
1973. *La conquista del Sur: Atlas del Territorio Federal Amazonas y del Distrito Cedeño del Estado Bolívar*. First edition, 101 pages. Caracas: Ministerio de Obras Públicas, Dirección General de Recursos Hidráulicos.
1979. *Atlas de la región sur*. Second edition, 67 pages. Caracas: Ministerio del Ambiente y de los Recursos Naturales Renovables.
- Couret, P.
1966. Observaciones sobre las Mirmecofitas Venezolanas. *Memoria [de la] Sociedad de Ciencias Naturales La Salle*, 26(73):3–40.
1982a. Redécouverte de variétés "rouges" du *Catasetum pileatum*. *L'Orchidophile*, 13(52):72–77.
1982b. The Rediscovery of the Red Varieties of *Catasetum pileatum*—Part 1. *The Orchid Review* 90(1067):277–281.
- Cruxent, J.M.
1961. El alto Ventuari. *Boletín Informativo*, 2:38–40. Departamento de Antropología, IVIC.
Cruxent, J.M., and M. Kamen-Kaye
1949–1950. Reconocimiento del área del alto Orinoco, Ríos Sipapo y Autana, en el Territorio Federal Amazonas, Venezuela. *Memoria [de la] Sociedad de Ciencias Naturales La Salle*, 9(25):271–317, 10(26):11–23.
- Dezzeo, N., and R. Buschbacher
In press. Legume Dominated Forests on Ultisols. In E. Medina, editor, *Ecology of Tropical Rain Forests of the Upper Río Negro Basin*. Caracas: Instituto Venezolano de Investigaciones Científicas.
- Dugand, A.
1956. Plantae praesertim Maypurenses a Humboldtio et Bonplandio in ripa occidentali fluminis Orinoco lectae ideoque ad floram colombiensem referendae. *Revista de la Academia Colombiana de Ciencias*, 9(36–37):315–324.
- Eden, M.J.
1968. Geographers on the Orinoco. *The Geographical Magazine* (London), 41(2):107–109.
1971. Scientific Exploration in Venezuelan Amazonas. *The Geographical Journal* (London), 137(2):149–156.
1974a. Palaeoclimatic Influences and the Development of Savanna in Southern Venezuela. *Journal of Biogeography*, 1(2):95–109.
1974b. Ecological Aspects of Development among Piaroa and Guahibo Indians of the Upper Orinoco Basin. *Antropología*, 39:25–56.
- Eden, M.J., and L. Chesney L.
1977. *Uso preliminar de imágenes LANDSAT para el estudio de la vegetación en el Territorio Federal Amazonas de Venezuela*. 16 pages. Caracas: Ministerio del Ambiente y de los Recursos Naturales Renovables, CODESUR. [Paper presented at the "Seminario sobre Ecología del Trópico Húmedo Americano," Mérida, 20–26 November 1977.]
- Edwards, A.M.C., and J.B. Thornes
1970. Observations on the Dissolved Solids of the Casiquiare and Upper Orinoco, April–June 1968. *Amazoniana*, 2(3):245–256.
- Ernst, A.
1888. Sertulum Aturense, o sea, lista de una pequeña colección de plantas que recogió el Señor Alfredo Jahn, Hijo, en Octubre de 1887 cerca de Atures, alto Orinoco. *Revista Científica de la Universidad Central de Venezuela, Caracas*, 1:219–223.
- Evans, C., B.J. Meggers, and J. M. Cruxent
1959. Preliminary Results of Archeological Investigations along the Orinoco and Ventuari Rivers, Venezuela. *Actas del XXXIII Congreso Internacional de Americanistas*, 2:359–369.

- Ewel, J.J., and A. Madriz
1968. *Zonas de vida de Venezuela: Memoria explicativa sobre el mapa ecológico*. 265 pages. Caracas: Ministerio de Agricultura y Cria.
- Ewel, J.J., A. Madriz, and J.A. Tosi, Jr.
1976. *Zonas de vida de Venezuela: Memoria explicativa sobre el mapa ecológico*. Second edition, 270 pages. Caracas: Ministerio de Agricultura y Cria.
- Fölster, H., and O. Huber
In press. Estudio ecológico sobre las interrelaciones suelo-vegetación en la cuenca del Río Galipero, T. F. Amazonas (Venezuela). Caracas: Ministerio del Ambiente y de los Recursos Naturales Renovables.
- Friedmann, H.
1948. Birds Collected by the National Geographic Society's Expeditions to Northern Brazil and Southern Venezuela. *Proceedings of the United States National Museum*, 97(3219):373-569.
- Friel, A.O.
1924. *The River of Seven Stars*. 476 pages. New York and London: Harper & Brothers Publishers.
- Fuentes, E.
Ms. L'Influence des plantes sauvages dans la culture Yanomami: Memoire. vi + 290 pages. Manuscript located at l'Ecole des Hautes Etudes en Sciences Sociales, Paris, France.
1980. Los Yanomami y las plantas silvestres. *Antropología*, 54:3-138.
- Gleason, H.A.
1929. A Collection of Plants from Mt. Duida. *Journal of the New York Botanical Garden*, 30(355):166-168.
- Gleason, H.A. [and collaborators]
1931. Botanical Results of the Tyler-Duida Expedition. *Bulletin of the Torrey Botanical Club*, 58(5-8):277-506.
- Gómez Picón, R.
1953. *Orinoco, río de libertad*. 501 pages. Madrid: Afrodisio Aguado, S.A.
- Goodland, R.J.A., and H.S. Irwin
1975. Amazon Jungle: Green Hell to Red Desert? *Developments in Landscape Management and Urban Planning*, 1: 155 pages. Amsterdam, Oxford, and New York: Elsevier Publ. Co.
- Gorinsky, C.
1969. Amazonas: A Study in Neglect. *The Geographical Magazine* (London), 41(4):308-312.
- Grelier, J.
1954. *Aux sources de l'Orénoque*. 283 pages. Paris: La Table Ronde.
1957. *To the Source of the Orinoco*. Translated by H.A.G. Schmuckler. 190 pages. London: Herbert Jenkins.
- Guariglia, M., and M.T. Iturriaga
1980. Los hongos macroscópicos de Paria Grande, Territorio Federal Amazonas. 154 pages. Graduate dissertation, Facultad de Ciencias, Universidad Central de Venezuela, Caracas, Venezuela.
- Guinand, L.E., and P.V. Sánchez
1979. Productividad primaria, fenología y composición florística de un tipo de sabana situada en el Territorio Federal Amazonas. 175 pages. Graduate dissertation, Facultad de Ciencias, Universidad Central de Venezuela, Caracas, Venezuela.
- Hames, R.B., and I.L. Hames
1976. Ye'kwana Basketry: Its Cultural Context. *Antropología*, 44:3-58.
- Harris, D.R.
1968. Venezuela's Empty Rain Forests. *The Geographical Magazine* (London), 41(3):216-220.
1971. The Ecology of Swidden Cultivation in the Upper Orinoco Rain Forest, Venezuela. *The Geographical Review* (New York), 61(4):475-495.
- Herrera, R., C.F. Jordan, H. Klinge, and E. Medina
1978. Amazon Ecosystems: Their Structure and Functioning with Particular Emphasis on Nutrients. *Interciencia*, 3(4):223-232.
- Hitchcock, C.B.
1947. The Orinoco-Ventuari Region, Venezuela. *The Geographical Review* (New York), 37(4):525-566.
1948. La Región Orinoco-Ventuari, Venezuela. *Boletín de la Sociedad Venezolana de Ciencias Naturales*, 11(72):131-179.
- Holdridge, D.
1933. Exploration between the Rio Branco and the Sierra Parima. *The Geographical Review* (New York), 23(3):372-384.
- Holmgren, P.K., W. Keuken, and E.K. Schofield, compilers
1981. *Index Herbariorum, Part I: The Herbaria of the World*. Seventh edition, vii + 452 pages. Utrecht and Antwerpen: Bohn, Scheltema & Holkema. The Hague and Boston: Dr. W. Junk B.V., Publishers.
- Holt, E.G.
1931. In Humboldt's Wake. *The National Geographic Magazine*, 60(5):620-644.
1933. A Journey by Jungle Rivers to the Home of the Cock-of-the-Rock. *The National Geographic Magazine*, 64(5):585-630.
- Hoyos, J.
1973. Expedición a la Laguna Asisa (Territorio Amazonas, Venezuela). *Natura*, 51:20-23.
- Huber, O.
1980. Die Felsvegetation am oberen Orinoko in Südvenezuela. In H. Reisigl, editor, *Blumenparadiese und botanische gärten der erde*, pages 200-203. Innsbruck: Pinguin-Verlag.
1982a. Significance of Savanna Vegetation in the Amazon Territory of Venezuela. In G.T. Prance, editor, *Biological Diversification in the Tropics*, pages 221-244. New York: Columbia University Press.
1982b. Esbozo de las formaciones vegetales del Territo-

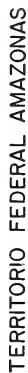
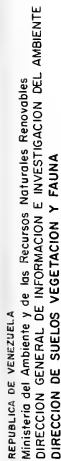
- rio Federal Amazonas, Venezuela. *Serie Informe Técnico*, DGS11A/IT/103; 36 pages. Caracas: Ministerio del Ambiente y de los Recursos Naturales Renovables.
- In press. Sabanas y formaciones abiertas del Territorio Federal Amazonas. In E. Ara, editor, *Atlas de la vegetación de Venezuela*. Caracas: Ministerio del Ambiente y de los Recursos Naturales Renovables.
- Humboldt, A. v.
- 1816–1831. *Voyages aux régions équinoxiales du nouveau continent*. 13 volumes. Paris: Librairie Grecque-Latine-Allemande, N. Maze, Librairie, and J. Smith & Gide fils.
- 1818–1829. *Personal Narrative of Travels to the Equinoctial Regions of the New Continent, during the Years 1799–1804*. Translated by H.M. Williams, 7 volumes. London.
- Jahn, A., Jr.
- 1909a. Beiträge zur Hydrographie des Orinoco und Río Negro. *Zeitschrift der Gesellschaft für Erdkunde zu Berlin*, 1909(2):98–121.
- 1909b. *Contribuciones a la hidrografía del Orinoco y Río Negro*. 52 pages. Caracas: Tipografía Universal.
- Jam Lander, P.
1958. Expedición al Territorio Amazonas. *Memorias [de la] Sociedad de Ciencias Naturales La Salle*, 18(50):77–89.
- Klinge, H., E. Medina, and R. Herrera
1977. Studies on the Ecology of Amazon Caatinga Forest in Southern Venezuela. 1: General Features. *Acta Científica Venezolana*, 28(4):270–276.
- Klinge, H., and E. Medina
1979. Río Negro Caatingas and Campinas, Amazonas States of Venezuela and Brazil. In D.W. Goodall, editor-in-chief, *Ecosystems of the World*, 9A:483–488. Amsterdam, Oxford, and New York: Elsevier Scientific Publishing Company.
- Koch-Grünberg, T.
1917. *Vom Roraima zum Orinoco: Ergebnisse einer Reise in Nordbrasilien und Venezuela in den Jahren 1911–1913, 1. Band: Schilderung der Reise*. x + 406 pages. Berlin: Dietrich Reimer (Ernst Vohsen).
1979. *Del Roraima al Orinoco*. Spanish translation by F. de Ritter, 402 pages. Caracas: Ediciones del Banco Central de Venezuela.
- Lasser, T., and B. Maguire
1950. A Report on the Plants of the Phelps' Cerro Yavi Expedition of 1947. *Brittonia*, 7(2):75–90.
- Lichy, R.
1978. *Ya Kú: Expedición Franco-Venezolana del alto Orinoco*. 343 pages. Caracas: Monte Avila Editores, C.A.
- Lichy, R., and M. De Civrieux
- [1949?] Exploración por la región Amazónica de Venezuela. *Cuadernos Verdes, Serie Nacional*, 79: 110 pages. Caracas: Comité Ejecutivo—III Conferencia Interamericana de Agricultura.
- Lizot, J.
1972. Poisons Yanomami de chasse, de guerre et de pêche. *Antropológica*, 31:3–20.
1978. Connaissance et usage des plantes sauvages chez les Yanomami. In E. Wagner and A. Zucchi, editors, *Unidad y Variedad*, pages 129–171. Caracas: Ediciones del Centro de Estudios Avanzados, IVIC.
1980. La agricultura Yanomani. *Antropológica*, 54:3–93.
- Mägdefrau, K.
1958. Kurzer Bericht Über die "Humboldt-Gedächtnis-Expedition." *Naturwissenschaftliche Rundschau*, 11:376, 377.
1960. Vom Orinoco zu den Anden. *Vierteljahresschrift der Naturforschenden Gesellschaft Zürich*, 105:49–71.
1963. Die Guaiac-Indianer am oberen Orinoco: Ein Blick in das Neolithikum. *Alt-Thüringen*, 6:652–660.
1973. *Hydropogon fontinaloides* (Hook.) Brid., ein periodisch hydro-aërophytisches Laubmoos des Orinoco und Amazonas. *Herzogia*, 3:141–149.
- Mägdefrau, K., and A. Wutz
1961. Leithölzer und Tonnenstämme in Schwarzwassergebieten und Dornbuschwäldern des tropischen Südamerika. *Forstwissenschaftliches Centralblatt*, 80:17–28.
1962. Die Pneumatophoren von *Symphonia*. *Veröffentlichungen des Geobotanischen Instituts Rubel in Zürich*, 37:183–187.
- Maguire, B.
1954. Venezuelan Guayana Expedition. *Science*, 119(3102):826–827.
1955. Cerro de la Neblina, Amazonas, Venezuela: A Newly Discovered Sandstone Mountain. *The Geographical Review*, 45(1):27–51.
1956. Distribution, Endemicity, and Evolution Patterns among Compositae of the Guayana Highland of Venezuela. *Proceedings of the American Philosophical Society*, 100(5):467–475.
1958. Highlights of Botanical Exploration in the New World. In W.C. Steere, editor, *Fifty Years of Botany*, pages 209–246. New York, Toronto, and London: McGraw-Hill Book Co., Inc.
1959. Exploración botánica en Guayana. *El Farol*, 21(185):6–11.
1961. Flora of the South American Guayana Highland. *The American Philosophical Society, Year Book*, 1960:317–321.
- 1964a. Two Decades of Exploration in the American Tropics. *The Garden Journal*, 14(4):124–132.
- 1964b. Botanical Exploration Conducted by the New

- York Botanical Garden: 1946–1964. *The Garden Journal*, 14(4):132–134.
1970. On the Flora of the Guayana Highland. *Biotropica*, 2(2):85–100.
1972. Guayana As a Floristic Province: Its Relationship within the Neotropics and to the Paleotropics. In 1 Congreso Latinoamericano V Mexicano de Botánica, *Resúmenes de los Trabajos*, pages 55, 56. México: Sociedad Botánica de México.
1979. Guayana, Region of the Roraima Sandstone Formation. In K. Larsen and L.B. Holm-Nielsen, editors, *Tropical Botany*, pages 223–238. London, New York, Toronto, Sydney, and San Francisco: Academic Press.
- Maguire, B., and K. Deery de Phelps
1951. Botánica de las expediciones Phelps en la Guayana Venezolana—I: Territorio Amazonas. *Boletín de la Sociedad Venezolana de Ciencias Naturales*, 14(78):5–19.
- Maguire, B., and J.J. Wurdack
1959. The Position of Cerro de la Neblina, Venezuela. *The Geographical Review*, 49(4):566–569.
1960. La posición del Cerro de la Neblina, Venezuela. *Boletín de la Sociedad Venezolana de Ciencias Naturales*, 21(96):234–239.
- Maguire, B. [and collaborators]
1953. The Botany of the Guayana Highland. [Part I.] A Report of the Kunhardt, the Phelps, and the New York Botanical Garden Venezuelan Expeditions. *Memoirs of the New York Botanical Garden*, 8(2):87–160.
1957. The Botany of the Guayana Highland—Part II. *Memoirs of the New York Botanical Garden*, 9(3):235–392.
1958. The Botany of the Guayana Highland—Part III. *Memoirs of the New York Botanical Garden*, 10(1):1–156.
1960. The Botany of the Guayana Highland—Part IV. *Memoirs of the New York Botanical Garden*, 10(2):1–37.
1961. The Botany of the Guayana Highland—Part IV(2). *Memoirs of the New York Botanical Garden*, 10(4):1–87.
1964. The Botany of the Guayana Highland—Part V. *Memoirs of the New York Botanical Garden*, 10(5):1–278.
1965. The Botany of the Guayana Highland—Part VI. *Memoirs of the New York Botanical Garden*, 12(3):1–285.
1965. The Botany of the Guayana Highland—Part VII. *Memoirs of the New York Botanical Garden*, 17(1):1–439.
1969. The Botany of the Guayana Highland—Part VIII. *Memoirs of the New York Botanical Garden*, 18(2):1–290.
1972. The Botany of the Guayana Highland—Part IX. *Memoirs of the New York Botanical Garden*, 23:1–832.
1978. The Botany of the Guayana Highland—Part X. *Memoirs of the New York Botanical Garden*, 29:1–288.
1981. The Botany of the Guayana Highland—Part XI. *Memoirs of the New York Botanical Garden*, 32:1–391.
- Mayr, E., and W.H. Phelps, Jr.
1967. The Origin of the Bird Fauna of the South Venezuelan Highlands. *Bulletin of the American Museum of Natural History*, 136(5):269–328.
1971. Origen de la avifauna de las altiplanicies del sur de Venezuela. *Boletín de la Sociedad Venezolana de Ciencias Naturales*, 29(121):309–401.
- Medina, E.
1969. Expedición AsoVAC al Alto Orinoco. *Acta Científica Venezolana*, 20(1/2):9–13.
1971. Expedición hover-craft al Río Negro-Casiquiare-Orinoco. *Defensa de la Naturaleza*, 1(4):24–35.
- Medina, E., R. Herrera, C. Jordan, and H. Klinge
1977. Man and the Amazon Rain Forest. *Nature and Resources*, 13(3):4–6.
- Micheleny y Rojas, R.
1867. *Exploración oficial por la primera vez desde el norte de la América del Sur*. . . . 684 pages. Bruxelles: A. La Croix, Verboeckhoven & Co.
- Norambuena O., H.
1975. Conquistaron el Cerro Marahuaca en busca de plantas medicinales. *Líneas*, 217:12–19.
- Ort, P.
1965. The Expedition of the Brazilian-Venezuelan Boundary Commission to Cerro de la Neblina. *The Garden Journal*, 15(5):199–203.
- Patouillard, N., and A. Gaillard
- 1888–[1889?]. Champignons du Vénézuéla et principalement de la région du haut-Orénoque, récoltés en 1887 par M.A. Gaillard. *Bulletin de la Société Mycologique de France*, 4:7–46, 92–129.
- Pittier, H., T. Lasser, L. Schnee, Z. Lucas de Febres, and V. Badillo
- 1945–1947. *Catálogo de la flora Venezolana*. 2 volumes, 423 and 577 pages. Caracas: III Conferencia Interamericana de Agricultura, Comité Organizador.
- Prance, G.T.
1971. An Index of Plant Collectors in Brazilian Amazonia. *Acta Amazonica*, 1(1):25–65.
- Putz, F.E.
1979. Biology and Human Use of *Leopoldinia piassaba*. *Principes*, 23(4):149–156.
- In press. Liana Biomass and Leaf Area of a "Tierra Firme" Forest in the Río Negro Basin. *Biotropica*.

RADAMBRASIL

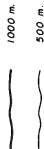
1975. Projeto RADAMBRASIL. Folha NA.20 Boa Vista e parte das folhas NA.21 Tumucumaque, NB.20 Roraima e NB.21. *Levantamento de Recursos Naturais*, 8:1-427. Rio de Janeiro: Ministério das Minas e Energia, Departamento Nacional de Produção Mineral.
- Ramos Pérez, D.
1946. *El tratado de límites de 1750 y la expedición de Iturriaga al Orinoco*. 537 pages. Madrid: Consejo Superior de Investigaciones Científicas, Instituto Juan Sebastian Elcano.
- Reichenbach f., H.G.
1873. Zum geographischen Verständniss der amerikanischen Reisepflanzen des Herrn Dr. Spruce. *Botanische Zeitung*, 31(2):28-29.
- Rice, H.A.
1921. The Río Negro, the Casiquiare Canal, and the Upper Orinoco, September 1919-April 1920. *The Geographical Journal* (London), 58(5):321-344.
1928. The Río Branco, Uraricuera, and Parima. *The Geographical Journal* (London), 71(2):113-143, (3):209-223, (4):345-357.
1937. *Exploration en Guyane brésilienne: Río Branco-Uraricuera-Parima*. 87 pages. Paris: Société d'Éditions Géographiques, Maritimes et Coloniales.
- Risquez-Iribarren, F.
1962. *Donde nace el Orinoco*. 403 pages. Caracas: Ediciones Grecco.
- Rogers, G.
1981a. A New *Platycarpum* (Rubiaceae) from Brazil. *Systematic Botany*, 6:87-89.
1981b. The Wood of *Gleasonia*, *Henriquezia*, and *Platycarpum* (Rubiaceae) and Its Bearing on Their Classification: Some New Considerations. *Brittonia*, 33(3):461-465.
In press. Anatomical and Taxonomic Studies in *Gleasonia*, *Henriquezia*, and *Platycarpum* (Rubiaceae). *Flora Neotropica*.
- Roncyayo, L.
1934. *El Río Orinoco y sus afluentes: Navegación, industria y comercio desde 1818 hasta 1920*. 280 pages. Caracas: Tipografía Cosmos.
- Sandwith, N.Y.
1925. Humboldt and Bonpland's Itinerary in Venezuela. *Kew Bulletin*, 1925(7):295-310. [Reprint in W.T. Stearn, 1968].
- Schomburgk, O.A., editor
1841. *R.H. Schomburgk's Reisen in Guiana und am Orinoco während der Jahre 1835-1839*. Leipzig: George Wiegand.
1931. *Robert Hermann Schomburgk's Travels in Guiana and on the Orinoco during the Years 1835-1839*. Translated by W.E. Rudge, viii + 202 pages. Georgetown:
- The "Argosy" Company, Ltd.
Schomburgk, R.H.
1840a. Journey from Fort San Joaquim, on the Río Branco, to Roraima, and Thence by the Rivers Parima and Merewari to Esmeralda, on the Orinoco, in 1838-9. *The Journal of the Royal Geographical Society of London*, 10(2):191-247.
1840b. Journey from Esmeralda, on the Orinoco, to San Carlos and Moura on the Río Negro, and Thence by Fort San Joaquim to Demerara, in the Spring of 1839. *The Journal of the Royal Geographical Society of London*, 10(2):248-267.
- Smole, W.
1976. *The Yanoama Indians: A Cultural Geography*. xiv + 272 pages. Austin and London: University of Texas Press.
- Spruce, R.
1908. *Notes of a Botanist on the Amazon & Andes*. Edited and condensed by A.R. Wallace, 2 volumes, lii + 518, xii + 542 pages. London: MacMillan and Co., Limited.
1970. [Reprint edition of Spruce, 1908, with a new foreword by R.E. Schultes.] New York and London: Johnson Reprint Corporation.
- Stearn, W.T., editor
1968. *Humboldt, Bonpland, Kunth, and Tropical American Botany: A Miscellany on the 'Nova Genera et Species Plantarum'*. 159 pages. Lehre: Verlag von J. Cramer.
- Stern, K.M.
1952. La selva entre dos Ríos. *El Farol*, 13(139):29-33.
1954. La génesis del Casiquiare. *Acta Científica Venezolana*, 5(2):52-53.
1970. Der Casiquiare-Kanal, einst und jetzt. *Amazoniana*, 2(4):401-416.
- Steyermark, J.A.
1966. Contribuciones a la flora de Venezuela, parte 5, 2: Notas sobre la flora del Monte Duida. *Acta Botanica Venezuelica*, 1(3/4):21-29.
1974. The Summit Vegetation of Cerro Autana. *Biotropica*, 6(1):7-13.
1975. Informe sobre la flora del Cerro Autana. *Acta Botanica Venezuelica*, 10(1-4):219-233.
1979. Flora of Guayana Highland: Endemicity of the Generic Flora of the Summits of the Venezuela Tepuis. *Taxon*, 28(1, 2/3):45-54.
- Steyermark, J.A., and H.A. Meyer
1945-1946. Informe de la misión de Chinchona en Venezuela. *Boletín de la Sociedad Venezolana de Ciencias Naturales*, 10(65-66):163-189.
- Steyermark, J.A. [and collaborators]
1951. Contributions to the Flora of Venezuela: Botanical Exploration in Venezuela, I. *Fieldiana: Botany*, 28(1):1-242.

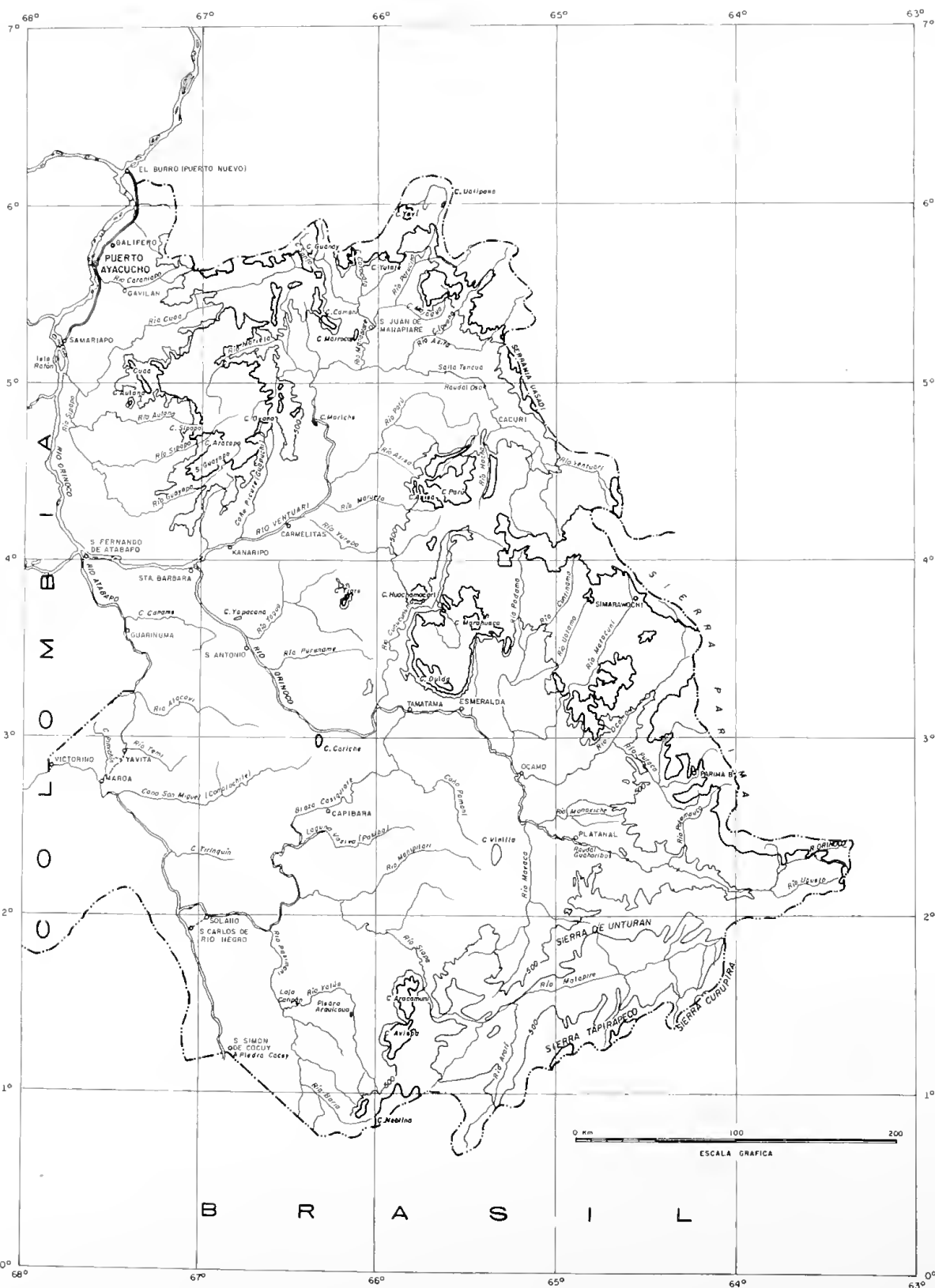
1952. Contributions to the Flora of Venezuela: Botanical Exploration in Venezuela, II. *Fieldiana: Botany*, 28(2):243-447.
1953. Contributions to the Flora of Venezuela: Botanical Exploration in Venezuela, III. *Fieldiana: Botany*, 28(3):449-678.
1957. Contributions to the Flora of Venezuela: Botanical Exploration in Venezuela, IV. *Fieldiana: Botany*, 28(4):679-1190.
- Tate, G.H.H., and C.B. Hitchcock
1930. The Cerro Duida Region of Venezuela. *The Geographical Review*, 20(1):31-52.
- Tavera-Acosta, B.
1906. *Rionegro: Reseña etnográfica, histórica y geográfica del Territorio Amazonas*. 309 pages. Caracas. [Second edition 1927; third edition 1954].
- 1913-1914. *Anales de Guayana*. First edition, 2 volumes. Caracas: Gráficas Armitano, C.A. [Second edition 1954, 1 volume; third edition [1976?], 1 volume, xiii + 605 pages.]
- Tillett, S.S., and J.A. Steyermark
1982. Contribuciones a la flora del Cerro Marahuaca, Territorio Federal Amazonas, Venezuela. *Ernstia*, 9:1-9.
- Uhl, C., K. Clark, H. Clark, and P. Murphy
1981. Early Plant Succession after Forest Cutting and Burning in the Upper Río Negro Region of the Amazon Basin. *Journal of Ecology*, 69:631-649.
- Uhl, C., H., Clark, K. Clark, and P. Maquirino
1982. Successional Patterns Associated with Slash-and-Burn Agriculture in the Upper Río Negro Region of the Amazon Basin. *Biotropica*, 14(4):249-254.
- Urban, I.
1906. Vitae itineraque collectorum botanicorum, notae collaboratorum biographicae, florum Brasiliensis ratio edendi chronologica, systema, index familiarum. *Flora Brasiliensis*, 1(1):1-154.
- Vareschi, V.
1959. *Geschichtslose Ufer: Auf den Spuren Humboldts am Orinoko*. 199 pages. München: Verlag F. Bruckmann.
- 1963a. Die Gabelteilung des Orinoco. *Petermanns Geographische Mitteilungen*, 107(4):241-248.
- 1963b. La bifurcación del Orinoco: Observaciones hidrográficas y ecológicas de la expedición conmemorativa de Humboldt del año 1958. *Acta Científica Venezolana*, 14(4):98-106.
1980. *Vegetationsökologie der Tropen*. 294 pages. Stuttgart: Verlag Eugen Ulmer.
- Wallace, A.R.
1853. *A Narrative of Travels on the Amazon and Rio Negro*. First edition. London, New York, and Melbourne: Ward, Lock and Co. [Second edition, 1889, xv + 363 pages.]
- Wurdack, J.J.
1960. A Historic Portage. *The Garden Journal*, 10(1):8-9, 13.
- Zerries, O., and M. Schuster
1974. Mahekodotedi. In O. Zerries, editor, *Ergebnisse der Frobenius-Expedition 1954/1955 nach Süd-Venezuela*, Band 2: xxviii + 443 pages. München: Klaus Renner Verlag.



General Geography of Territorio Federal Amazonas, Venezuela.

(Base map: CODESUR, 1975, scale 1:1,000,000).





TERRITORIO FEDERAL AMAZONAS

MAP 1

General Geography of Territorio Federal Amazonas, Venezuela.

(Base map: CODESUR, 1975, scale 1:1,000,000).



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